

DOCUMENT RESUME

ED 251 161

JC 850 009

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 TITLE Games and Simulations in the Community College Classroom.
 PUB DATE Dec 83
 NOTE 147p.; Funded by a Title III grant.
 PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)
 -- Information Analyses (070) -- Reference Materials
 - Bibliographies (131)

EDRS PRICE MF01/PC06 Plus Postage.
 DESCRIPTORS Class Activities; College Instruction; Community Colleges; *Educational Games; Game Theory; Learning Activities; *Simulation; Two Year Colleges

ABSTRACT

This discussion of the use of games and simulations in instruction includes a number of examples of activities that can be used in the community college classroom. Section I assesses the value of games and simulations as an approach to learning; defines games, simulations, and non-simulation games; considers the advantages and disadvantages of the approaches; reviews relevant research findings; and discusses cooperative games/simulations. Section II presents criteria for selecting games/simulations for the classroom and highlights five phases of their use (i.e., planning and preparation; introduction; assignment of roles and teams; running of the game; and debriefing). Section III explains the steps in designing non-simulation games and simulations. Section IV lists 34 games and 17 simulations that can be played at various ages and in classes on all subjects. For each, information is provided on objectives, rules, preparation, materials, age group, values, examples, and variations. A list of resources is presented in section V, including companies, centers, institutes, and individuals who produce games/simulations for education. Finally, section VI presents an annotated bibliography and lists additional readings and journals carrying articles on games/simulations. (HB)

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GAMES AND SIMULATIONS IN THE
COMMUNITY COLLEGE CLASSROOM

J. Thomas Butler

December 1983

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ABSTRACT

The purpose of this paper is to present a background and rationale for the use of games and simulations in the community college classroom. Further, it is written to assist the instructor in locating, selecting, designing and conducting games and simulations.

The advantages and disadvantages of games and simulations vary with the application. Like any learning experience, there are strengths and weaknesses. A good game or simulation is a flexible, responsive learning environment with a supportive structure. Thus, an imaginative instructor can overcome most disadvantages by adapting the activity to learner needs and environmental constraints.

A review of the literature produced support for the use of classroom games and simulations. Among these conclusions are that feelings of efficacy, awareness of the structure of social systems, performance of students of low academic ability and speed of learning can all be improved through the use of games and simulations. It was also concluded that games and simulations are as effective as most other instructional techniques at increasing pupil learning at the cognitive level. The greatest impact of games and simulations is in the area of cognitive learning.

Selection of games and simulations should be based upon a number of factors. These factors include the objectives of the course or lesson, prerequisite skills, modalities to be involved,

students' age, maturity level and interest, level of interpersonal interaction, physical limitations of the situation and cost.

The five phases in the conduct of a game or simulation are planning and preparation, introduction, assigning roles or teams, running the game and debriefing.

The steps in designing nonsimulation games are identifying applicable subject matter or principles to be learned, determining how a contest can operate under a set of rules, testing the game and improving the game. Somewhat more complicated, the steps in designing simulations are determining the primary function, establishing the context, formulating the internal structure, determining the rules, writing instructions, designing materials, testing the simulation and modifying and replaying.

Thirty-four educational games and seventeen simulations are described. An extensive list of resources, an annotated bibliography and a list of additional readings are provided.

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I. ARE GAMES AND SIMULATIONS FOR YOU?

- A. Introduction
- B. Definitions
- C. Advantages and Disadvantages
- D. Research Findings
- E. Cooperative Games and Simulations

A. Introduction

Games and simulations have been a part of learning for many years. The increasing frequency of international and national conferences devoted solely to the subject, the proliferation of articles and establishment of journals devoted to games and simulations is evidence of increased popularity. Presently, the development of these activities are a major enterprise at a number of institutions, including the University of Southern California and the University of Michigan. Courses in games are offered at such institutions as U.S.C., Cornell, and Princeton.

A number of skills and professions are taught with simulations. Law students train in moot court. Astronauts, airplane pilots, and automobile drivers train on simulators. Laws require simulated fire drills and bus evacuations. Some industries select employees based on performance in simulations. The reasons for such usage are clear. Simulation allows presentation on three levels, facts about the issue being presented in scenario, the processes and skills that must be engaged in, and the development of alternative strategies of decision making (50:12).*

Play is a normal, enjoyable portion of life, an integral part of every society and culture. Johan Huizinga wrote in Homo Ludens,

"Play adorns life, amplified it and is to that extent a necessity, both for the individual - as a life - and for society by reason of the meaning it contains, its significance, its expressive value, its spiritual and social associations, in short, as a cultural function. The expression of it satisfied all kinds of cultural needs (7:12)."

*Citations refer to annotated bibliography.

One might ask, "Why not satisfy the cultural needs involved with learning by play?"

Simulations and games constitute a rather different approach to learning than do the usual methods. The major premise is that persons do not learn by being taught but by experiencing the consequences of their actions. Games and simulations present the student with an approximation of certain parts of society. By acting in this setting the player can begin to see the consequences of his actions before he faces the real action, choices, and consequences (24).

B. Definitions

1. Games are contests in which players operate under rules to gain a specified objective. Games may be academic in nature, competitive and/or cooperative.
2. Simulations are situations in which participants assume roles in a lifelike environment in order to learn how the environment works and/or to solve problems inherent to that environment. Simulations are often referred to in this context as simulation games.
3. Nonsimulation games are academic games in which players are obliged to use principles of a subject or discipline in order to solve a problem. An example is Anagrams (see game #9).

C. Advantages and Disadvantages

Cruickshand and Telfer (29:77) list the following advantages of simulations and games over more conventional methodologies:

1. They guarantee participants an experience that is like experiences they would have in the real world.
2. They afford opportunities for participants to solve difficult problems themselves rather than to observe someone else solving them.
3. They provide greater transfer from the training situation to a real life situation.
4. They provide a responsive environment which allows immediate knowledge of how well the participant is performing.
5. They telescope (compress) time.
6. Because participants must make a decision and live with the consequences, they are psychologically engaging.
7. They are safe.
8. They are enjoyable.

In addition to these benefits, games and simulations are usually thought to spur motivation, causing students to try harder. Similarly, they are thought to provide a positive attitude toward learning.

They also help by providing rapid feedback and reinforcement. The usual lag between learning and applying is minimized. This facet coupled with the social setting in which these activities are carried out would seem to enhance learning. After and during play, the learner is able to conduct self evaluation and thus to self direct his behavior.

Specificity is another advantage of simulations and games. They can be developed to suit the student's maturity and interests as well as the curriculum needs. Thus, they can be a useful tool in individualizing instruction.

While yielding specificity, simulations also help integrate subject matter. Seldom does the simulation technique restrict itself to one subject.

Simulations convey a feeling for the complexity of the decision making process and for the multiplicity of variables to be considered when making decisions. The decision making process is becoming a focal point in a number of curricula. By translating concrete thinking into a sequence of dramatized possibilities, the student is able to expand his awareness of alternatives. This is an integral part of the decision making process.

By controlling his own fate in a nonreal environment, learners experience feelings of efficacy. This is partially due to understanding how the component parts of a system fit together and developing ways to manipulate it. Hopefully, these feelings transfer to the real existence, so that students have the confidence to act upon information they acquire from the real world to solve real world problems.

One of the primary advantages of games is the capacity to be points of departure for discussion. In this way, they may actually supplement other methods.

Games and simulations seem to break down barriers to interaction with others and encourage participation. This had a number of advantages. It facilitates communication and promotes peer interdependence. Students can learn from someone other than the teacher. The polarization that often exists between the teacher and the student is reduced. Since the player does not rely on the teacher for judgment, and both the judgment and

the teacher are less threatening. The player becomes responsible under the rules for his own outcomes and so does not blame the teacher. This enhances the student-teacher relationship.

Cruickshank and Telfer (29:77-78) list the following disadvantages of games and simulations:

1. Teachers are relatively unfamiliar with simulations and games and consequently hesitant to use them.
2. They sometimes require large amounts of time.
3. They sometimes focus on experiences which are more supplementary than basic, i.e., more peripheral than critical to what must be learned.
4. They are less available than traditional teaching and learning materials.
5. They can be expensive.
6. They can result in seeming confusion and real noise.
7. Some games are poorly developed and their use results in failure and frustration.
8. Not all participants will like them.
9. They often limit the number of people who can play so some students may be left out.

Additionally, games may not always teach what the instructor thinks they teach. In fact, some students may simply be learning techniques that enable them to master the game rather than learning the lessons contained in the game.

When used in isolation from discussion, books, or other methods, games may be useless and may encourage overly conformist attitudes.

A number of ego skills such as competitiveness, cooperation, socialization, interaction and management of assertiveness, aggressiveness, and hostility are relevant to the gaming situation (74:71). Certainly, the mastery of these skills is a positive outcome. However, unless one thoroughly understands the dynamics of the game's

ego-building possibilities, there is a chance that one can magnify the opposite of what he thinks he is accomplishing. One way to do this is to overemphasize winning.

Horn and Zuckerman (45:502) point out other reasons that teachers underuse games and simulations. Many teachers view them as highly complex, strange and even slightly upsetting. They depend upon a high degree of student cooperation. A few uncooperative students can destroy the positive effects of the exercise. Finally, it is very difficult to preview the activity without actually playing it. In simulations that require large numbers of participants, this is particularly difficult.

If this appears to be a prohibitive number of disadvantages, consider other teaching methodologies. All have advantages and disadvantages. Games and simulations are no different in this respect. However, a good game or simulation is a flexible, responsive learning environment with a supportive structure. It takes modification without losing its impact. For these reasons an imaginative teacher can overcome most disadvantages by adapting the activity to the needs of the learners involved.

D. Research Findings

The research on the effectiveness of games and simulations is rather mixed. The reasons for this will be discussed presently. This section summarizes the research and presents several specific examples of recent research.

According to Wentworth and Lewis (83:66), the use of games and simulations have been found to be neither significantly better nor worse than other learning experiences in their impact on student achievement. In fact, these authors claim that the research suggests that games and simulations have little measurable impact on student cognitive learning when compared to other techniques.

Cruickshank and Telfer (29:79) provided a more detailed summary of the research. The conclusions were:

1. Games and simulations in the classroom may lead to increased pupil learning at the cognitive level but to no greater degree than any other medium of instruction.
2. Students appear to acquire approximately equal knowledge and intellectual skills as they would in other learning situations.
3. Pupils will be motivated to participate in the game, but their interest in the subject or discipline may not be improved.
4. Computerization of a game offers advantages which can be related to the aim, implementation, and social aspects.
5. Discussion aids participants' satisfaction with simulation and the addition of case studies adds to participant interest.
6. Simulation may or may not stimulate pupils' feelings of efficacy.
7. Games and simulations are as effective as other teaching techniques but no more effective in general.

Maidment and Bronstein (59:24-7) came to the following conclusions regarding research findings on simulations:

1. Knowledge of facts and principles are not taught better by simulations than by conventional techniques.
2. Simulations are good at teaching the structure of social systems such as the family and legislature. They are even more effective if students design their own games.
3. Simulations are effective in changing player attitude relating to the simulated system, e.g., race relations and the legislative process.

Other summaries concur on the following conclusions regarding learning, knowledge, and intellectual skills:

1. The use of games and simulations increases critical thinking ability.
2. Although the amount of learning is not significantly greater, information is learned faster than it would be utilizing other methods.
3. Non-simulation skill building games can lead to a significant increase in learning.
4. Students of low academic ability may improve their performance because of increased interest.
5. Simulations may not improve pupils' learning of factual material.

Regarding student attitudes, various summaries conclude that:

1. Games and simulations are effective at arousing interest and activity in the learning process.
2. Combining case studies with simulations increases interest.
3. Games and simulations lead to a tendency to discuss schoolwork with parents, teachers, and friends.
4. Games and simulations produce an increased tendency to attend school regularly.
5. Discussion in a simulation brings more satisfaction with learning than simulation without discussion, discussion without simulation, or neither.
6. Games and simulations have their greatest impact on affective learning.

After a four-year study in a classroom where all teaching was game based, Devries and Slavin (33) found that this format increased academic performance, group cohesiveness, and cross racial friendship patterns.

They found improved pupil attitudes toward school and a higher perception of the probability of success. They also reported that the pupils became more active in the learning process. The role of the teacher changed from a manager to a curriculum expert and resource person. On the other hand, they found limitations in skills such as evaluating art and analyzing stories or written compositions.

Sutton-Smith (74:125) used the game "How Many Eggs in My Bush?" with an experimental group. When compared with a control group, the experimental group increased significantly in their ability to acquire the skill of number conservation.

Dickerson's (77:5) research on young children supported the effectiveness of both active and passive games on developing sight vocabulary among young children.

Hunt (49) compared site visits to a building with a mental image using a model of the building and a series of sequential slides with a sample of "older persons." The simulation group was superior in mental images, way-finding performance and designing their own routes.

Ploeger (68) demonstrated that a computer program simulation was effective in teaching science classroom laboratory safety to preservice elementary teachers and preservice science teachers enrolled at the University of Texas at Austin.

Thomas (80) compared a group of college students who played the game Master Mind with a control group that did not play. The experimental group was superior in cognitive development, separation and control of variables, and proportional reasoning.

College business majors were tested by Klein (53) after participating in a simulation of a business situation. The simulation was found to be an effective tool, requiring a minimum of overlap with other media. It was found to sensitize its users to critical international business

issues. Klein also concluded that the redundancy between simulation and lecture can be reduced.

In a group of physical therapy students, Protas (69) found simulation to influence cognitive clinical performance but not more overt behavioral skills.

Denison (32) compared students in a welding class who substituted half of their normal practice time with practice on a simulator with those who practiced using conventional welding techniques. The simulator was found to substitute satisfactorily for the conventional practice.

Madison (58) used the simulation Jeffrey's Department Store in high school distributive education classes. A comparison of this simulation group with a group who underwent traditional methods of instruction yielded no significant difference in attitude or achievement on the Sales Comprehension Test.

Using cooperatively structured games in secondary schools, Jacovino (52) found significantly greater development of a cooperative goal structure versus usage of more traditional lessons stressing cooperation. This was especially true for independent activities. There was a good deal of transfer from games to independent activities.

Sampson (73) tested a computerized laboratory simulation to determine its usefulness in improving acquisition of the skills used in genetic analysis. No significant differences were found between the simulation and "live" experiments. A secondary analysis showed significantly higher scores for the experimental group. The researcher concluded that the simulation was as effective but no more effective than "live" experiments and could be a good back-up.

Boocock (16) used games to find empirical evidence of four general types of positive learning. The four types were inducement to student

motivation and learning, vicarious experience, intellectual learning, and changes in student learning.

In a study of tenth grade males with external loci of control, Arthurs (5) found that games changed the locus of control toward internality in a relatively short period of time.

Gonzales-Miles (41) used the simulation game Bafa Bafa to test if this strategy would develop worldmindedness. No significant change was found.

Fluck (36) compared fifth grade students who played computational-strategy games with a control group. The experimental group scored significantly higher in problem solving ability but no difference was found in computation performance.

From the studies and research summaries cited above, it is apparent that findings are indeed mixed and inconclusive. There are a number of reasons for this problem. First, existing games vary immensely and most of the research tests only one game or simulation. This is a practical necessity but it makes it very difficult to generalize regarding the usefulness of the method. Second, many of the studies undertaken are flawed by inadequate testing procedures, poor research design, or the use of unsophisticated statistics. Third, it is often difficult to determine the important variables to be tested. Fourth, there are few attempts to replicate existing research. This makes the conclusions necessarily suspect.

The instructor should not necessarily allow the inconclusiveness of the research to discourage the use of games and simulations. Every application takes place in a unique setting with a unique group of individuals. As with the use of lecture or films, the results will not be identical from application to application. The clever instructor will overcome problems before, during, and after applications, constantly

revising and improving. Probably the most redeeming quality of games is their flexibility. Revising and improving games is often a better learning process for both teacher and student than the actual playing.

E. Cooperative Games and Simulations

Mention should be made of a special type of activity, the cooperative game and simulation. Although we live in a competitive world, we also live in a world where cooperation and interdependence are necessary qualities.

Competitive games teach many lessons which are necessary to functioning in the world. However, there are some drawbacks to competition which should be addressed, particularly where children are involved. In competitive games, it is guaranteed that someone loses, fails, or is rejected. Some competitive situations fail to teach competition in a healthy manner. Some do not teach sensitivity to others' feelings.

Cooperative games by their nature are directly related to communication, cohesiveness, trust and the development of social and interaction skills. Players learn to share, to empathize with others, to be concerned with others' feelings and to work to get along better. Quarrels are reduced and the players feel accepted and involved, feelings which lead to heightened self esteem. Involvement contributes to a sense of belonging and satisfaction since each player is partially responsible for the successful outcome of the game. Of course, these activities are fun and the enjoyment is enhanced because the players are free to play without fear of failure or rejection (64:6-7).

Lentz and Cornelius (55:1) asserted that these games differ from competitive games in that:

1. All participants strive toward a common goal, working with each other instead of competing against each other.
2. All players win if the goal is attained, or all lose if the goal is not attained.

3. All players compete against the non-human elements of the game rather than against any players.
4. Players do not play identically, necessarily, but unitedly in an effort to reach the common goal.

Cooperative games require little or no equipment, certainly no more than competitive games. Most require the outlay of virtually no money. The rules need not be strictly adhered to. Players can work out their own details, often as they play. They can make suggestions to each other, allowing for planning during the game. The concept is the important thing.

A few cooperative games such as Equality are described in section IV. Others, such as the Strawberry Box Game (really a simulation) can be easily adapted to a cooperative format. Instructors are encouraged to develop their own cooperative games. See game #30 and simulation #9.

II. SELECTING AND CONDUCTING GAMES AND SIMULATIONS

A. Selection

B. Conducting Games/Simulations

A. Selection

For the instructor who wishes to use games and simulations, there are two initial alternatives, selecting existing materials or designing new ones. Part of this section deals with selecting existing games and simulations. Section III deals with designing new activities.

There are seven criteria to be used for evaluating games and simulations for use in the classroom. These criteria can best be expressed in the form of the following questions:

1. Does the game reflect the intended objectives?
2. What additional skills do students need to bring to the activity?
3. What modalities are involved?
4. Does it match the students interests, age, and maturity levels?
5. What is the level of interpersonal interaction?
6. Does it fit the physical limitations of your learning situation?
7. What is the game's cost in terms of usability?

First, consider the instructional objectives of your course or unit. These, of course, vary by discipline, course, and unit within the course. They should be in writing and prepared well in advance of the beginning of the course. This facilitates selection of learning opportunities, including games/simulations. If commercially produced materials are being considered, they often contain a statement of the objectives of the activity. Belch (11) and Horn and Zuckerman (47) provide excellent descriptions of hundreds of commercially produced simulations and games as well as reviews of these activities. Often a teacher can get an idea for designing a game by browsing through such

volumes. In noncommercial games, one can get a sense of what the game accomplishes just by reading a description of it. Games and simulations can meet most any instructional objective, including diagnosis and evaluation.

The teacher should determine what skills need to be brought to the game. This is particularly important in selecting games for children. The community college instructor needs also to consider such areas as mathematical skill level, familiarity with scenario, and vocabulary.

The modality is usually easily understood from reading a description of a game. The teacher needs to determine if the game is active or passive, and the degree of movement it requires. The degree of interaction, whether that interaction is in the form of committees or between individuals, whether the game is played on a board, with cards, or special pieces of equipment are all crucial bits of information to the selection process.

Most games and simulations suggest the age group for which the activity is designed. However, many can be adapted to a wide range of ages. A more difficult problem is the maturity of the learners. The instructor will have to make a subjective appraisal of the maturity of the students and apply it to the simulation. Even college students vary in their maturation, but it should be remembered that many simulations are designed to increase maturity. We may assume that the student has some interest in the subject if he is in the class. It should be remembered, however, that there are a number of different simulation scenarios that teach similar lessons. These scenarios should be selected and adapted with the interests of the learners in mind.

The level of interaction between players is a consideration worth noting. Ordinarily, games and simulations encourage interaction. This

often creates a good deal of noise which may disturb others. Provisions should be made in advance to deal with this problem. Levels of interaction vary from operating in isolation (none at all) to yes or no questions to group discussion to outright physical contact. The objectives of the lesson and the maturity of the participants are closely related to the level of interaction.

The physical limitations of the class are crucial to the selection of an activity. One should consider the number of players involved, the size of the room, the materials available, and the proximity to other classes. Often roles can be combined if it appears that there are too few participants or they can be played by committees rather than individuals if it appears there are too few roles. It is usually advisable to have everyone involved as player, referee, or manager.

Finally, one needs to consider the cost of the activity in terms of money, time, and reusability. Many games and simulations require no outlay of funds; many are very expensive. Some simulations require a charge per use and are generally expensive. Games and simulations vary in length from a few minutes to several days. Most can be used over and over and so the initial cost is less than it first appears. The materials can often be produced by the instructor, although some may require some expense. These are all important considerations in the selection of games. When justifying the outlay of time and money, the reader is encouraged to seek out reviews of the product.

B. Conducting Games/Simulations

There are five phases of the conduct of a game or simulation.

They are the following:

1. Planning and preparation.
2. Introduction.
3. Assigning roles or teams.
4. Running the game.
5. Debriefing.

After the activity is selected the instructor must plan its use. The appropriate time to use the game/simulation is often a difficult decision. If the instructor is new to this technique, it is probably best to use it near the close of the unit so that students bring more knowledge to the situation and it is more realistic. This will also lessen the chance of frustration and game debilitating behavior.

The instructor should familiarize himself with the rules and the protocol of the activity. It may be necessary to practice the game before using it in the classroom. A flexible schedule should be arranged and materials and the playing area should be made ready.

The introduction of the game/simulation should be in sufficient detail to both orient the players to it and to positively predispose them toward it. This introduction should be brief, giving only an overview of the game. The instructor should explain that he is there to help and facilitate the action.

Decisions are made about role allocations before their actual assignment. The instructor should take into account participants' backgrounds and their perceived ability to participate successfully. There

are consequences to poor role allocations which may destroy the effect of the game. Neither role allocations nor team assignment should be made with regard to friendships. The ability of the players is the crucial consideration. If it appears that an allocation arouses feelings that will be debilitating, the instructor should be flexible enough to reassign.

As the play begins, the instructor should explain the rules, present the scenario if applicable, and distribute the materials. If the game has several sections, only the rules for the present section should be given. Time limits should be announced. If applicable, officials should be appointed. As the game begins the teacher should make a deliberate effort to shift the locus of his role to that of background advisor, observer, and facilitator. If problems arise, the leader should feel free to modify the rules or the situation, particularly in a simulation exercise. Flexibility, imagination, and continuous action are key ingredients to the conduct of games and simulations.

The debriefing may be the most important part of the exercise. The teacher has an important role in guiding the discussion so that it provides an opportunity to reflect on what has happened, how it happened, and what it means. Therefore, the teacher must decide what he wishes to accomplish in the debriefing and plan for it.

It is wise to start with general questions and see what aspects of the exercise interest the players. Those aspects should be pursued specifically. It is important to encourage players to describe what happened without forcing more out of them than they want to give. Players can analyze the meanings, purposes, and benefits of the activity. They can even analyze the design of the activity although the instructor is cautioned against assuming that the students always understand what the various features of the game represent (50:21-23).

The instructor should conclude the debriefing with a summary. This summary should provide guidance to the players in drawing conclusions about the game or simulation. It should form a bridge between the exercise and future activities which should be related to the game and the discussion of it.

III. DESIGN OF GAMES AND SIMULATIONS

A. Nonsimulation Games

B. Simulations

A. Nonsimulation Games

Games are relatively easy to design. They are a natural vehicle for learning. The themes that can be worked into games are hampered only by the imagination of the designer. Games are designed for a number of purposes including to help develop more favorable attitudes toward the subject, to enhance self concept, to help teach the subject matter and to help teach problem solving (28:79).

Step 1. Identify the academic subject which has attributes such as principles, facts, or words and which requires practice and/or memorization in order to produce habitual or spontaneous use. Examples include the elements of the periodic table in chemistry and the position of the keys on a typewriter.

Step 2. Determine how a contest among players can operate under rules. This necessitates the consideration of goals, resources, player capabilities, and player constraints. Develop the rules for the contest and write them at the appropriate level in precise, sequential fashion. It is a good idea to build in the element of chance so that winning is not solely based on handling concepts or skills.

Step 3. Test the prototype game. Evaluate the room arrangement, the materials, the willingness of the participants, and the clarity of the directions.

Step 4. Based on the test, redesign and improve the game. This is a process which should be considered never-ending (28:87-8).

If properly designed, the nonsimulation game will allow players to experience the consequences of their actions immediately, thus bringing the future into the present. It will actively interest students in the educational process and remove the teacher from a

judgmental position. A well conceived game will allow the player to experience a sense of controlling his own destiny. If the game is designed well, it will accomodate a wide range of student abilities. Finally, the game should aid the student in attaining the educational objectives of the class.

B. Simulations

A number of authors including Cruickshank (28:40-54), Shears and Bowers (74:318-344), Sullivan, Davey, and Dickerson (77:43-7), Maidment and Bronstein (59:29-53), and Horn and Zuckerman (47:508-12) have offered models for designing simulations. The following strategy is a composite of some of these models. Although age group of the intended players is an important concern, it is assumed in this strategy that the players are community college students.

Step 1. Determine the Primary Function.

The designer has some system or object in mind with which he wishes to give the learners experience. This is the problem area, e.g., the political system, family unit, or work situation. The designer should read about, study, observe, and experience the system.

Simulations can serve many functions. They can serve to transmit knowledge so that the participant is better able to understand his culture. They can structure social encounters in which individuals make decisions from varying perspectives with different values and interests. If properly designed, simulations can serve as expressive models of social control, organization, and interaction found in the culture. They can also soften or disguise more stringent features of the real world so the participant may gradually accustom himself to the demands of life (74:324). The designer should realize that these functions usually take place in well-designed simulations, but the skill of the designer determines how well these functions mesh with the objectives of the class. The particular skills and concepts the students need to practice (defined by course or unit objectives) should

be built into the game objectives.

Step 2. Establish the Context.

During this step, several preliminary decisions are made which restrict the internal structure of the activity. At this stage, the designer must have a fairly definite idea of the degree of simplicity and complexity in the simulation. The simulation must accurately reflect the structure and dynamics of the social process. If it is too complex, the central aspect of the simulated system will be lost. If it is too simple, the student will get the impression that the process is less complex than it really is.

The designer must also decide how competitive and/or cooperative the environment will be. The question of the role of chance in success in the environment must be weighed.

All of these factors are integrally related to the actual environment. The number of players, space, time, and materials available have a direct bearing on the structure of the simulation.

After these considerations, the designer should decide which features of the real world will be included in the simulation world, which will be excluded, and which will be modified. These are called the rules of relevancy, rules of irrelevancy, and transformation rules, respectively (74:326). Any aspects of the real world may be included, provided they do not break down the imaginary boundary between the real and the game world. Exact representation of real world attributes is not necessary; they may be symbolized. Features of the real world may be abstracted to meet the restrictions of time, space, materials, or personnel. Rules of relevancy, irrelevancy, and transformation serve to partition the simulation from the real world. In community college simulations, features of the activity should closely approximate those of the real world. For instance, intangible features such as status,

wealth, and social position are meaningful and can be used effectively.

Step. 3. Formulate the Internal Structure

At this step the designer is to develop the players, their motives, purposes, goals and resources. The scenario is developed and the most relevant features of the object system are clarified.

In designing roles it is important that each player learns to act in relationships to and with others, i.e., each player acts as an individual and as a member of a team, doing a specific job on that team. In adult simulation it is possible to employ multiple roles.

The designer must clearly delineate the goals of each actor. Goals may be material, social or psychological; they may be long-term or short-term, team or individual. The player must have certain power and resources with which to attain these goals. The designer can manipulate role power to alter the power the player has over others, increasing it or decreasing it as needed. Further, the power of the role can be adapted to suit the various needs the individual players brings to the exercise.

The resources of the players are the materials, equipment, helpers, and trappings of the role and may be abstract or symbolic. Even though the resources may be abstract, it is better to express them in concrete terms. It is crucial that the goals of the roles be similar to those in the real world and that the resources of the roles be in similar proportion to those in the real world. There should always be room for the players to have flexibility in their roles, to meet their goals and solve their problems as they see fit.

The scenario is an outline of the plot of the simulation, a fictitious setting. The actual plot is left to the players within the rules, but a scenario should be written to give direction to the action. The scenario

may be simple or complex. Open ended plots are often most effective with college students. The scenario should provide the players with a background which is realistic enough to be interesting and to promote participation.

Step 4. Determine the Procedural Rules to Govern the Action.

Procedural rules include rules of transaction among players and decision of outcome. These rules constrain the players' action and channel their behavior toward their goals. In college student groups, it is acceptable for players to mutually control the rules.

Rules of procedure tell how materials are deployed. They tell who, when, and how a player moves and who can initiate and control such movement. They explain when and what kind of communication is permitted. They explain when outside elements such as third parties or chance can intervene or arbitrate problems. There are usually procedural rules to handle major and minor infractions, rules of restitution, repression, or expulsion. Procedural rules tell if a player is competing with himself, others, or not at all. They state criteria for winning and losing if applicable. Obviously, all these factors must be thought out very carefully by the designer.

Step 5. Write Instructions.

The instructions may be referred to as the administrative rules. They include simple explanations of the movement of the game, the play periods, time allocations, and mechanics of promoting interaction. They explain the physical layout of the simulation environment.

Often administrative assistants, referees, or bankers are needed. The instructions should include their training and an explanation of their duties.

Instructions should include the pre-briefing period when roles are assigned, goals explained, and rules explained. They should also

instruct the teacher in a debriefing activity which gives the players a chance to analyze and criticize the action and to discuss what was learned.

Step 6. Design Materials

The scenario should be copied and distributed. Role descriptions and rules should be copied and distributed to the appropriate players, leaders, and assistants. In some simulations, such items as spinners, boards, dice, and cards are necessary and some simulations require equipment to be designed and built. It is also a good idea to have name tags for all participants who are playing roles other than themselves.

Step 7. Try Out the Game

The first time (or few times) you run the simulation is evaluative. A discussion with the players should be held after the try out. Existing simulations are often improved by the players. The design or redesign of simulations is considered by many experts to be a better learning experience than the actual participation in the simulation.

A number of questions should be prepared for the post simulation discussion. Some examples are the following:

1. What is the central problem presented in the simulation?
2. What choices are available to the players?
3. What did you think of the rules?
4. What was the best and worst thing about the rules?
5. How could you improve the rules?
6. What roles could be improved and how?
7. What did you like most and least about the activity?
8. Did you acquire any new skills or learn any new information by participation in the simulation?
9. How could you make the simulation more fun?

The designer should try to evaluate the effectiveness of the room arrangement, the materials, and the instructions. Player response is a helpful source of information. The willingness of the players to complete the activity is an important aspect to be assessed. If students lose interest or wish to stop before the simulation is finished, modification is in order. The designer would do well to ask players to identify the point at which interest ebbed, the aspects of the simulation which were unnecessary or uninteresting, and ways they would improve these aspects.

Step 8. Modify and Replay

Using his own and the participants' observations, the simulation should be modified. A replay is another evaluative step. The designer should not be afraid to continually modify the simulation. Such modifications will almost certainly improve the activity

If an instructor wishes to use simulation in the classroom, but lacks an idea, existing simulations are excellent starting points. As Horn (47:508) stated, "Making simulations emerges almost naturally from the study and use of existing ones." The reader is encouraged to peruse Section IV B of this paper for a description of several simulations useful in a number of courses. Section V is an extensive list of resources. You may contact these addresses to obtain descriptions of games and simulations. Finally Section VI is a list of references on games and simulations, many of which carry descriptions of games and simulations. Horn and Zuckerman (47) and Belch (11) are particularly recommended.

IV. GAMES AND SIMULATIONS

A. Games

B. Simulations

IV. GAMES AND SIMULATIONS

What follows is a list of games and simulations which can be played at a variety of ages and in classrooms of all subjects. The individual game or simulation may or may not be useful to any particular instructor. However, when reading these activities, remember that the utility comes in your ability to adapt them and change them to your purposes. In order to initiate this process, many of the descriptions include a section on "VARIATIONS."

Do not confuse "OBJECTIVES" and "VALUES" section. "OBJECTIVES" of a game or simulation are those goals for which one strives in order to complete the activity or to win it. The "VALUES" are the expected benefits that are attained by participating. Of course, these benefits can be manipulated by a resourceful teacher.

In reading these descriptions, you are encouraged to read the entire description of any one activity. By reading only a section or two, you may miss a key element which could be adapted to your needs. For instance, if "AGE LEVEL" is not at first appropriate, this does not mean that you could not change the game in a subtle way to bring it in line with the age group in your class.

GAME #1
TO TELL THE TRUTH
(45:32-3)

OBJECTIVE: To identify the contestant who is impersonating the "celebrity guest" from his answers to prearranged questions.

RULES: Panelists (usually 3, 4, or 5) are provided with a list of questions regarding the "celebrity guest" and/or his area of expertise. With mature groups panelists may ask their own questions as well. The three contestants introduce themselves, each as the "celebrity guest." Each contestant has a slightly different answer to each of the listed questions. The "celebrity" should have all correct answers. The panelists each have a specified amount of time to question the contestants. At the end of the question-answer period each panelist makes a decision as to which contestant is really impersonating the "celebrity guest." Finally, the moderator asks, "Will the real _____ please stand up?"

PREPARATION: Extensive preparation requires the writing of around 20 questions and duplication of them for all contestants and panelists. Three sets of answers to each question must be made and the contestants must learn his answer to each question. The moderator must also have a brief description of the celebrity and his area of expertise.

MATERIALS: None

AGE GROUP: Junior high school through adult*

VALUES: Entire class, especially the panelists and contestants, are motivated to prepare for the game by learning about the "celebrity guest" and his area of expertise. Game can be used in a number of subject areas. It opens possibilities for discussion.

EXAMPLE: Each contestant introduces himself by saying, "My name is Dr. Callum, I am a physician dealing with the problems of arthritis."

The moderator describes Dr. Callum - "Dr. Callum has been specializing in rheumatoid arthritis for the past twelve years. His/her research deals with the environmental causes of arthritis and treatments that may relieve arthritic pain. Many of his/her treatment techniques are patented and have been sold to over two hundred hospitals throughout the world. He/she is a noted public speaker on the subject of arthritis - its cures and causes. We will begin questioning with the first panelist."

Some example questions with answers for panelists A, B, and C follow:

*estimate of author

GAME #1
To Tell the Truth

1. What is arthritis?
 - A. An inflammation and pain in the joints.
 - B. A rheumatic disease. An inflammation of the joints.
 - C. An inflammation and corresponding pain in the joints.
2. Is there only one type of arthritis?
 - A. Yes, the only kind is rheumatoid arthritis.
 - B. No, there are several kinds. The most common type is rheumatoid arthritis.
 - C. No, there are thousands of kinds of arthritis but they can all be cured by the same method.
3. What is your opinion of arthritis-strength aspirin?
 - A. I feel it is only glorified aspirin.
 - B. The only active ingredient is aspirin.
 - C. I feel it has significant advantages over regular aspirin.
4. What is liefcort?
 - A. I think it is the name of a type of arthritis of the hip.
 - B. A drug claimed to cure arthritis that was concocted by Dr. Robert Liefman.
 - C. I am sorry but I do not know.

VARIATION:

- 1) The game could be used in literature class so that the contestants are authors or poets.
- 2) In history, the contestants could be famous historical figures.
- 3) In chemistry, the contestants could be the elements of the periodic table.
- 4) In science or health classes, the contestants could play the role of the actual disease, such as arthritis or syphilis.

GAME # 2
DRUG KNOWLEDGE GAME
(25:24-5)

OBJECTIVE: To guess the name of the drug which is assigned to the player.

RULES: Write the name of drugs (may be group names, brand names, generic names, and common names) on index cards, one drug per card. Pin one card on the back of each player. The player should not see his own card. Players stand up and mingle about the room asking "yes" and "no" questions of each other in an effort to determine their own drug. Players may ask only three questions of any one co-player. If a student guesses his drug, pin the card to his lapel and allow him to continue answering questions.

PREPARATION: Write names of drugs on index cards.

MATERIALS: Index cards and pens.

AGE GROUP: High school through adult.

VALUES: This game can illustrate how much or how little students know about drugs. It can reinforce the idea that peers are not always reliable sources of information. It can improve questioning skills and reasoning.

EXAMPLE QUESTIONS: Am I an upper? Am I legal? Am I swallowed?

EXAMPLE DRUGS: Cough syrup, Nytol, marijuana, PCP, heroin, aspirin, beer, tobacco, mescaline, methadone, antacids, Ex-Lax, Midol, gin

VARIATIONS:

- 1) An excellent activity for teachers who will be teaching sex education as well as students is to use the name of parts of the reproductive system.
- 2) In a history class, one could use names of historical figures.
- 3) In a chemistry class, one could use the names of compounds or the elements of the periodic table.
- 4) In an anatomy class, the proper names of anatomical parts could be used.

GAME #3
GROUPING GAME
(25:25)

OBJECTIVE: With the item name pinned to their shirt, the players must group themselves according to their cards.

RULES: Students all have the name of an item, such as a drug, written on a card and pinned to their shirts. Without talking to each other the students group themselves. One student from each group leaves the room after the grouping is complete. The teacher now asks what group each considers itself to be. After discussion and agreement (if possible) the person outside the room returns and gives his perception of the group.

PREPARATION: Write names of items on cards.

MATERIALS: Index cards and pens.

AGE GROUP: High school through adult.

VALUES: Teaches a cooperative approach and the use of nonverbal communication. Leaders usually emerge. Allows students to see that items may be grouped in more than one way.

VARIATIONS:

- 1) In English class, use a list of words
- 2) In Music class, use a list of musical works or composers.

GAME #4
DRAW A SONG
(64:48)

OBJECTIVE: To guess the title of a song from creative clues.

RULES: Given a large sheet of paper, one player tries to draw clues to a particular song. When someone guesses the name of the song, the entire group stands up and sings the song.

PREPARATION: The students must be familiar with several songs which the teacher should teach beforehand.

MATERIALS: Magic marker and a large sheet of paper.

AGE GROUP: Eight through twelve years

VALUES: Fosters sense of cooperation, develops creativity, and familiarize group with songs.

VARIATIONS: The game can be adapted to draw clues to historical events, countries, famous people, etc.

GAME #5
I LOVE MY LOVE
(71:2)

OBJECTIVE: To finish the phrase "I love my love with an A because she is so a- _____" with an adjective which starts with the appropriate letter.

RULES: The letter changes to progress through the alphabet. If a player cannot think of an adjective in the allotted time, he is out. Winner is the last player to remain in the game.

PREPARATION: None

MATERIALS: Pencil and paper.

AGE GROUP: Primary grades or anyone needing vocabulary development

VALUES: Develops vocabulary

EXAMPLE: See "OBJECTIVE"

VARIATION:

1) Change the trigger sentence to force use of other parts of speech or to use more sophisticated thought processes.

2) Add a longer refrain such as "I love my love with an A because he/she is so a- _____. His/her name is A- _____ and he/she lives in A- _____."

GAME #6
EQUATION MATCH
(28:75-6)

OBJECTIVE: Find a card in your hand that equals the sum or difference of two or more cards on the board. This is an equation match.

RULES:

- 1) The dealer gives each player 5 cards and puts 3 cards face up on the board.
- 2) Dealer plays first and play is rotated clockwise.
- 3) If a player can make a match, he explains it to the other players and places the pile of 3 matched cards in front of him.
- 4) If he cannot make a match, he discards one card from his hand and places it with other face-up cards on the board.
- 5) If using a playing card deck, a player can give any number from 0 through 9 to a wild card.
- 6) There will not always be 3 cards on the board. If the first player makes a match, he removes 2 or 3 cards from the board leaving 1 card or no cards. Therefore, the second player cannot make a match and must discard. If the first player cannot make a match, he must discard and there will be 4 cards on the board.
- 7) When all the players have played all of the cards from their hands, the round ends. The dealer for the next round is the player to the left of the previous dealer. He gives each player 5 cards and begins play. The cards that were on the board at the end of the previous round are left there. None are added.
- 8) The game ends when all the cards have been used. The winner is the player with the most matches.

PREPARATION: Numbering cards.

MATERIALS: Deck of playing cards or stack of index cards with numbers printed on them.

AGE GROUP: Elementary school through adults with poor basic arithmetic skills.*

VALUES: Development of basic arithmetic skills.

VARIATION: Match the multiplication of two cards or the division of one card by another.

GAME #7
BUILD A SENTENCE
(54:225)

OBJECTIVE: To build a sentence from words independently selected by participants.

RULES: Each participant writes a word on an index card. The word is selected independently from other players' selections. If the number of players is small, the players may each select 2 or 3 words. Each player in turn lays down a card with a word on it. Cooperatively, they try to form one or more sentences. If necessary articles and prepositions may be added as the sentences develop.

PREPARATION: None

MATERIALS: Note cards and pencils

AGE GROUP: Eighth grade through adult

VALUES: Develops skills in construction of sentences.

VARIATIONS:

- 1) Restrict each participant's word selection to a particular part of speech.
- 2) Select a theme for the sentences, such as sex/sexism, sports, or animals.
- 3) Instead of writing sentences, write a poem.

GAME #8
ACROSTICS
(28:27)

OBJECTIVE: Find words of equal length, the number of words being the same as the number of letters in each word, and arrange them so that each word can be read vertically as well as horizontally.

RULES: Each player is given a starter word. Starter words have equal number of letters. As a variation, each player may select his own starter word. The first player to finish is the winner.

PREPARATION: Selection of starter words.

MATERIALS: Pencils and paper.

AGE GROUP: Elementary school through adult*

VALUES: Use of principles of English and spelling and development of vocabulary.

EXAMPLES:	H	E	A	R	T
	E	M	B	E	R
	A	B	U	S	E
	R	E	S	I	N
	T	R	E	N	D

*estimate of author

GAME #9
ANAGRAMS
(28:27)

OBJECTIVE: To form new words either by rearranging the letters of other words or by making words from a pool of letters chosen by chance.

RULES: Each player may have a time limit to devise as many combinations as possible or players may take turns.

PREPARATION: None

MATERIALS: Pencils and paper

AGE GROUP: First through eighth grade*

VALUES: Use of principles of English and spelling and development of vocabulary.

EXAMPLES:

- 1) From the letters in MERRY CHRISTMAS, form as many words as possible of any length.
- 2) From the letters in THEY SEE, rearrange to form words of the same letters, such as THE EYES.
- 3) From the letters SAMRAGNA, form words such as the name of this game.

*estimate of author

GAME #10
HIGH ROLLER
(54:148-9)

OBJECTIVE: Using cards with digits 1-9, the object is to remove cards so that the lowest sum of point value is remaining.

RULES: The game can be played by any number of players. Nine cards are used with a digit 1-9 written on each card. On each turn the player casts the dice over and over, each time turning over cards that add up to the number cast until it is not possible to turn over any more cards. The player's score is the sum of the remaining cards. Lowest score wins.

PREPARATION: Print number 1 on a card, number 2 on another card, etc., through number 9.

MATERIALS: Pair of dice and nine note cards.

AGE GROUP: Second grade through adult with weakness in basic arithmetic.

VALUES: Practice in use of basic arithmetic skills.

EXAMPLE: A player casts the dice and gets a 9 (6 on one die, 3 on the other). He may turn over any combination of cards adding up to 9. Thus 3 and 6; 4 and 5; 1, 3, and 5; 1 and 8; or 9 only. Suppose he chooses 1 and 8 these cards are eliminated. The same player casts again. Suppose 11 comes up and he chooses to turn over 7 and 4. Suppose 11 comes up again and he chooses this time to turn over 5 and 6. Now only 2, 3, and 9 are left on the board. If he casts again and a 6 comes up, he finds there is no combination of 2, 3, and 9 to make 6. Therefore, his turn is over and his score is $2 + 3 + 9 = 14$.

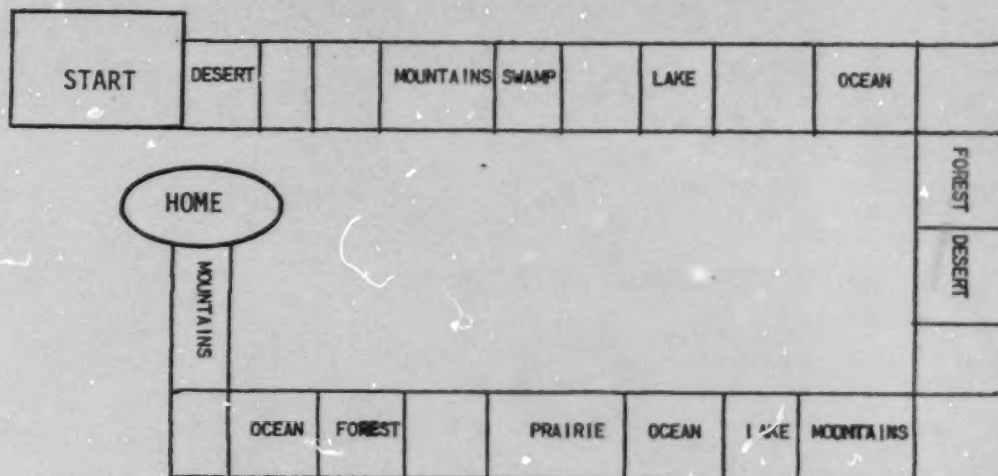
VARIATIONS:

- 1) Change the rules to use subtraction. Thus a roll of 6 could be made by 9 and 3.
- 2) Use numbers 1 to 20 on the cards and use multiplication and division.

GAME #11
ANIMAL GOING HOME
(54:101)

OBJECTIVE: To learn about the natural habitat of animals.

RULES: Draw a playing board with spaces marked by different characteristics of the earth such as lake, forest, desert, mountains and swamp. Each player selects an animal and is designated as that animal. Each player rolls one die in turn. If he lands on a space which is a natural habitat of his animal, he gets another turn. If he lands on a space which is hostile to his animal, he skips a turn. If he lands on a free space, he simple passes the roll to the next player. The first player home wins.



PREPARATION: Draw board.

MATERIALS: Board and figure to mark location.

AGE GROUP: Elementary and Kindergarten*

VALUES: Learning of natural habitat of animals.

*Estimate of author

GAME #12
HEALTH OR HAZARD?
(20:30-1)

OBJECTIVE: Presented with an environmental hazard, players must provide the countermeasure of "defensive" health protection measure.

RULES: Two teams of players prepare an "offensive" hazards array and a "defensive" health protection measures arsenal. Each hazard and each health protection measure should be written on a separate index card. After a period of preparation each side alternately presents a "challenge" - that is, an "offensive" hazard - to a member of the opposing team. The challenged player has fifteen seconds to respond with the correct health protection measure. No coaching from teammates is allowed. Referee(s) are also students and decide if response is appropriate. Teams alternate making "challenges" until all players have been challenged. Winning team is team which wins the most rounds.

PREPARATION: A cognitive introduction to health hazards of the environment should cover the detrimental effects of noise, air pollution, etc., and the measures available to protect the public. The teams should be provided with "offensive" hazards and "defensive" measures or allowed time to provide them.

MATERIALS: Large cards and pens or magic markers.

AGE GROUP: Adults or high school students.

VALUES: Instills appreciation of the environment, an awareness of hazards and the means of dealing with them.

EXAMPLES: "Offensive" hazards - radiation (alpha, beta, gamma, microwave), noise, dusts, carbon monoxide, toxic chemical wastes, such as herbicides, pesticides, and industrial materials.

"Defensive" measures - medical surveillance, environmental manipulation, personal protection, carbon filters, and management decisions.

GAME #13
CROSSWORD PUZZLES

OBJECTIVE: To construct and play a crossword puzzle on a given subject.

PROCEDURES: Allow students to choose the subject or assign it, but make it general enough to allow for a large number of spaces, clues, and possible answers. Allow a small number of clues outside the chosen subject if necessary. Allow players to try to solve each others' puzzles.

PREPARATION: None

MATERIALS: Ruler, pencil and duplicating material.

AGE GROUP: Junior high school through adult.*

VALUES: The fun and challenge of constructing the puzzle provides motivation to study the subject.

EXAMPLES: War heroes, poets, fitness, Presidents, geography of the United States

*Estimate of author

GAME #14
COULD BE
(50:27-9)

OBJECTIVE: To spell as many words as possible given two letters and their placement.

RULES: The game starts with a row of four dashes on each player's paper. One player selects two letters and another selects the placement of the letters on the dashes. The players have two minutes to write down as many words with those two letters in those places as possible.

PREPARATION: None

MATERIALS: Paper and pencil

AGE GROUP: Elementary school or others with poor vocabulary or spelling.*

VALUES: Improves spelling, increases vocabulary, teaches phonic patterns in words as an aid to reading and writing and allows discovering rhyming words and patterns.

EXAMPLE: The letters A and R are selected and placed in spaces 2 and 3. Possible words are hare, hard, tart, wart, etc.

VARIATIONS: Use longer words, more or less letters chosen, increase or reduce time limit, or require words from a foreign language.

*Estimate of author

GAME #15
HANGMAN

OBJECTIVE: To solve a word or phrase puzzle by guessing the spelling of that word or phrase one letter at a time.

RULES: 1) One player, called the hangman, chooses the secret word or phrase of 5 to 8 letters.

2) The hangman publicly draws a picture of a gallows on a sheet of paper and the appropriate number of dashes to indicate the size of the chosen word or phrases. If more than one word is used, the appropriate spaces between dashes should be included.



3) Each of the other players in turn asks a letter in trying to discover the secret word. The other players are playing against the hangman.

4) If the letter guessed is in the secret word or phrase, the hangman writes that letter in the appropriate dash, as many times as it appears. If the letter is not in the secret word or phrase, then the hangman draws a head on the gallows.

5) Play continues in this manner until the other players discover the secret word or until they are hanged by the Hangman. They are hanged when all parts of the person are added to the gallows in order as follows:

- a) head
- b) body
- c) right leg and foot
- d) left leg and foot
- e) right arm and hand
- f) left arm and hand
- g) ears
- h) face

6) The hangman wins if he succeeds in hanging the other players (8 misses). The other players win if they succeed in discovering the secret word or phrase.

PREPARATION: None

MATERIALS: Paper and pencil

AGE GROUP: Elementary school or others with spelling deficiencies.

VALUES: Improves spelling and allows practice in word completion. This game may be especially valuable in courses where spelling is difficult such as Medical Terminology or Anatomy.

EXAMPLE:

1) Guess O: _ _ _ _ _

2) Guess N: _ _ _ _ N _

3) Guess E: _ E _ E N _

4) Guess P: _ E _ E N _

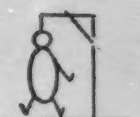
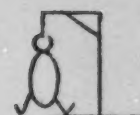
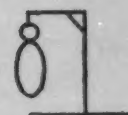
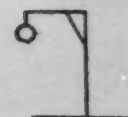
5) Guess L: _ E _ E N _

6) Guess A: _ E _ E N _

7) Guess T: _ E _ E N T

8) Guess C: _ E C E N T

9) Guess R: R E C E N T



The hangman loses, the secret word is recent.

VARIATIONS: Increase the number of letters. Increase or decrease the number of body parts by adding both legs at the same time or adding feet and hands separately from legs and arms.

GAME #16
BEEZE
(50:46-9)

OBJECTIVE: To gain the most points by spelling words given two letters and their order.

RULES: 1) One player picks two letters and another player chooses the order of the letters. Thus, if one player chooses R and O, another player may choose the order to be RO or OR.

2) Each player then draws three columns on his paper, heading them "Back-to-Back," "Breakthrough," and "Bounced Around." (Notice the first letter in the column headings are 3 B's, hence the title of the game.) In the first column the players write words that have the letters "back-to-back" in the chosen order. In the second column they write words which contain the chosen letters in the chosen order, but with at least one other letter which has made a "breakthrough" between the chosen two. In the third column players write words which have the chosen letters, but the order has been "bounced around."

3) Words may be used only once.

4) Players may not use plural words formed by S or ES or verbs ending in S, ES, ED, or ING.

5) Players are limited to 5 minutes

6) Scoring: 5 points for every "Back-to-Back" word, 3 points for every "Breakthrough" word, 1 point for every "Bounced Around" word.

PREPARATION: None

MATERIALS: Paper and pencil

AGE GROUP: Anyone with need for improvement in vocabulary and spelling.

VALUES: Increases vocabulary and spelling ability.

EXAMPLE: Given the two letters R and O in that order.

BACK-TO-BACK	BREAKTHROUGH	BOUNCED AROUND
rope wrote professional frost Ronald	ratio orthodontist furlong	oral cord cover York for

5 x 5 = 25

3 x 3 = 9

5 x 1 = 5

39 points

VARIATIONS:

1) Use only words from the foreign language being studied.

- 2) Reduce the time limit for a more difficult game; increase the time limit for a less difficult game.
- 3) Choose letters that often cause spelling problems, such as I and E.
- 4) Limit the choice of words to the subject being studied, such as "foreign cities," "World War II," etc.

GAME #17
NIM
(50:66-70)

OBJECTIVE: To be the player who removes the last chip (separately or together with others in the same row).

RULES: 1) To start, players place 15 chips (coins will do) in three rows of 3, 5, and 7 chips like this:

```

      • • •
      • • • • •
      • • • • • • •
  
```

- 2) Two players play, moving alternately.
- 3) Each player may remove as many chips as he wishes, but from only one row each turn. It is permissible to remove an entire row.
- 4) Player must take at least one chip each turn.
- 5) The objective is to be the player who removes the last penny (together with others or separately).

PREPARATION: None

MATERIALS: 15 objects to be used as chips

AGE GROUP: Elementary through adult.

VALUES: Teaches the powers of 2. Teaches to work in the base 2 math.
Teaches binary math.

EXAMPLE: The chips are arranged as above

- 1) Player A removes 2 from top row, leaving 1-5-7.
- 2) Player B removes 3 from middle row, leaving 1-2-7.
- 3) A removes 2 from bottom row, leaving 1-2-5.
- 4) B removes 1 from bottom row, leaving 1-2-4.
- 5) A removes 1 from middle row, leaving 1-1-4.
- 6) B removes 4 from bottom row, leaving 1-1.
- 7) A removes 1 from top row, leaving 1.
- 8) B removes 1 from middle row and wins.

VARIATION:

- 1) Have 4 or more rows and have a different number of chips in each row. That is, add chips and rows. It is possible to play with any number of rows and any number of chips.
- 2) Allow a player if he wishes to remove chips and then divide that row into two separate rows.
- 3) Change the objective, so that the player to take the last chip loses.

COMMENT: NIM is one of the oldest math games in the world. NIM was such a hit in the movie "Last Year in Marienbad" that theaters gave out match books that described the rules of the game on the inside covers.

NIM has been used in many of the "new math" curricular to teach base 2. Hyman (50) offers a wonderful explanation of "how to win at NIM" in the appendix of his book.

GAME #18
TWENTY QUESTIONS
(7:43)

OBJECTIVE: To determine the name, place or object being thought of by a player.

RULES: A player thinks of a name, place, or object within the given framework of the class. That is, if the class is studying the Civil War, then battle sites may be the only limitation. Other players take turns asking questions which may only be answered by "yes" or "no." If the thought is identified, the person who identified it thinks of the next item. If the item is not identified after twenty questions, the player thinks of another.

PREPARATION: None

MATERIALS: None

AGE GROUP: Unlimited*

VALUES: Builds knowledge of subject matter.

EXAMPLES: Subject is Civil War, word is Vicksburg; subject is drugs, word is cocaine; subject is the skeletal system, word is humerus; subject is American authors, word is Poe.

VARIATION: Limit the number of questions or use time limit instead of question limit.

*Estimate of author

GAME #19
WORDPOWER
(7:62-3)

OBJECTIVE: To determine the five letter mystery word.

RULES: The first player thinks of a five letter word. The second player guesses a five letter word. The first player tells the guesses how many letters of the first guess word are in the mystery word. Based on this information, the second player continues guessing until he guesses the mystery word. Roles are then reversed. After a predetermined number of rounds, the winner is declared to be the player who made the fewest number of total guesses.

PREPARATION: None

MATERIALS: It helps to keep track of letters with pencil and paper.

AGE GROUP: Late elementary through adult.*

VALUES: Practice in logical deduction and the process of elimination.
Improves spelling and vocabulary.

EXAMPLE:

Guess 1 - DANCE	1 correct letter
Guess 2 - SANDY	2 correct letters
Guess 3 - HANDY	1 correct letter (There must be an S and no H)
Guess 4 - SOUND	1 correct letter (Eliminates O, U, ND from guess 2 there must be an A or Y)
Guess 5 - SUNNY	1 correct letter (Eliminates Y. The word contains S, A - from guess 1, eliminates C,E)
Guess 6 - FAILS	2 correct letters (Eliminates F, I, L)
Guess 7 - STRAP	4 correct letters (The word contains two of the letters from T, R, P)
Guess 8 - GRASP	3 correct letters (The word contains T and no G. We now have S, A, T plus either R or P and one other or a repeated letter.)
Guess 9 - STAMP	3 correct letters (So it is S, T, A, R and another - no M or P)
Guess 10- STRAW	Correct!

VARIATIONS: Make the game more difficult by using longer words. Make the game less difficult by telling guesser not only how many letters are correct but how many are correctly placed (not necessarily which letters are correctly placed). The game can also be made easier by using shorter words. Still another variation is to use numbers instead of words.

*Estimate of author

GAME #20
ALPHA
(7:69)

OBJECTIVE: To think of words that begin and end with the same letter.

RULES: The winner is the player who thinks of the most words that begin and end with the same letter.

PREPARATION: None

MATERIALS: Paper and pencils

AGE GROUP: Late elementary to adult.

VALUES: Builds vocabulary and spelling skills.

EXAMPLE: HUNCH, WINDOW

VARIATION: Require the players to find words which begin and end with the same letter, but the use of a given letter more than once is forbidden. The winner is the player who uses the most letters of the alphabet as first and last letters of words. For example, AMNESIA, BEDAUB, CYCLONIC, DEDICATED, EVERYONE, etc. Impose a time limit.

GAME #21
STAIRWAY
(7:71)

OBJECTIVE: To think of progressively longer words beginning with a certain letter.

RULES: Select a letter of the alphabet. Each player writes down words which begin with that letter in increasing order of length, that is, a two-letter word, a three-letter word, a four-letter word, etc. The player who builds the longest stairway is the winner. A time limit is imposed.

PREPARATION: None

MATERIALS: Pencil and paper

AGE GROUP: Elementary through junior high school.*

VALUES: Builds vocabulary and spelling skills.

EXAMPLE: M

```

M  E
M  A  N
M  I  N  T
M  E  L  O  N
M  E  A  D  O  W
M  I  S  S  I  O  N
M  A  T  E  R  N  A  L

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*Estimate of author

GAME #22
CROSSWORD
(7:73)

OBJECTIVE: To accumulate points by building words in crossword-puzzle fashion.

- RULES:**
- 1) Prepare a grid of at least 9 x 9 squares.
 - 2) One player begins by placing a word, one letter per space onto the grid, either across or down.
 - 3) The other players form other words interlocking with one or more words.
 - 4) A point is awarded for each letter added which does not interlock with an existing word.
 - 5) Play continues until neither player can find further letters to form new words.
 - 6) The player with the highest score wins.

PREPARATION: Draw grid.

MATERIALS: Pencil and paper

AGE GROUP: Elementary school through adult.*

EXAMPLE:

				S				
D	I	C	T	A	T	I	O	N
I		A		D				O
S	T	R	E	N	U	O	U	S
T		W		E		I		E
U		A		S	O	L	I	D
R	O	S	E	S		E		
B		H				D	I	E

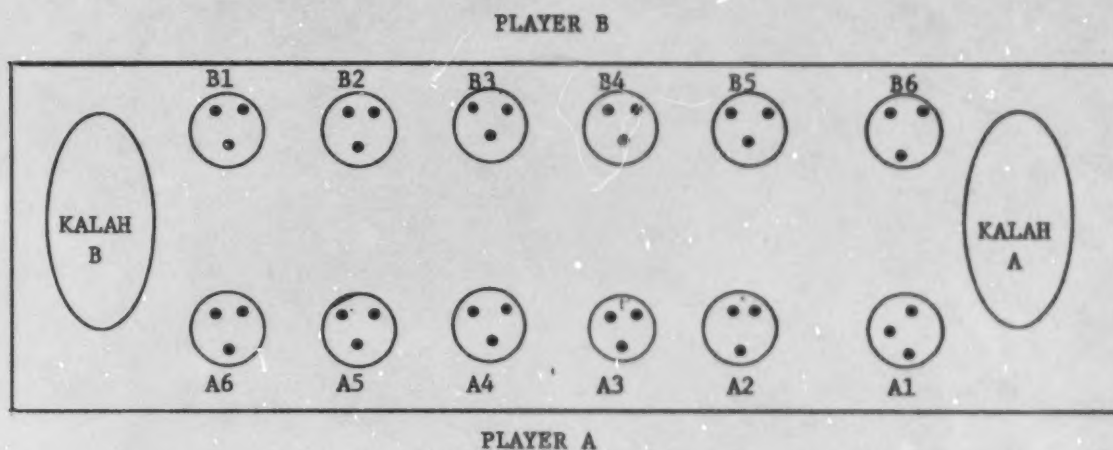
A plays STRENOUS - 9 points
 B plays CARWASH - 6 points
 A plays DISTURB - 6 points
 B plays DICTATION - 7 points
 A plays NOSED - 3 points
 B plays SADNESS - 5 points
 A plays ROSES - 2 points
 B plays SOLID - 3 points
 A plays OILED - 3 points
 B plays DIE - 2 points

*Estimate of author

GAME #23
KALAH
(74:156-9)

OBJECTIVE: To accumulate as many playing pieces as possible in a large oval KALAH to each player's right.

RULES: Two players sit on opposite sides of the board. Three playing pieces (peas) are deposited in each of the twelve round pits.



Each player in turn picks up all the peas in any one of his own six pits and puts them one by one in each pit around to his right. If there are enough peas to go beyond your own KALAH, they are distributed in your opponent's pits (except his KALAH). They now belong to the opponent. If the player's last pea lands in his KALAH, he gets another turn. If the last playing piece lands in an empty pit on his own side, he captures all of his opponent's playing pieces in the opposite pit and puts them in his own KALAH together with his capturing pea. A capture ends the move. Captured peas remain in the KALAH until the end of the game.

A round ends when all six pits on one side are empty. The other player adds the remaining peas in his pits to his KALAH. The score is determined by who has the most peas. The first player to reach 40 points ends the game and wins.

PREPARATION: None

MATERIALS: KALAH is marketed by Behavioral Sciences Company. However, the game can be played using cups and chips, coins, or peas.

AGE GROUP: All ages

VALUES: Develops analytic skills and arithmetic skills.

VARIATION: Place more than 3 peas in each pit.

GAME #24
MAGIC ARITHMETIC
(63:19)

OBJECTIVE: To determine the age and month of birth of a player after a series of arithmetic functions.

RULES: Counting January as 1, February as 2, March as 3, etc., write down the number of the month you were born in; multiply it by 2; add 5, multiply by 50; add your age; subtract 365; add 115. By knowing the formula, the teacher can tell the player's age and month of birth. FORMULA: The last two digits are the age of the player and the first digit(s) are the number of the month of birth.

PREPARATION: None

MATERIALS: Paper and pencil

AGE GROUP: Anyone with deficiencies in arithmetic,* but particularly 4th-6th grades.

VALUES: Piques curiosity in arithmetic function.

<u>EXAMPLE:</u>	Start with	11	(November)
		$\times 2$	
		$\underline{22}$	
		+5	
		$\underline{27}$	
		$\times 50$	
		$\underline{1350}$	
		+33	(Age)
		$\underline{1383}$	
		-365	
		$\underline{1018}$	
		+115	
		$\underline{1133}$	
			33 years of age, born in November

*Estimate of author

GAME #25
MAGIC PROBLEM
(63:18)

OBJECTIVE: To determine the chosen number after a series of arithmetic functions.

RULES: Ask students to think of a number and write it on their paper. They must then multiply the number by 3; add 1; multiply by 3; add the original number. By knowing the formula, the teacher can tell what the original number was. FORMULA: Strike off the last digit of the final product. The remaining number will be the original number.

PREPARATION: None.

MATERIALS: Paper and pencil

AGE GROUP: Anyone with deficiencies in arithmetic*, but particularly 4th-6th grades.

VALUES: Piques curiosity in arithmetic function.

EXAMPLE: Start with 384

$$\begin{array}{r}
 \times 3 \\
 \hline
 1152 \\
 +1 \\
 \hline
 1153 \\
 \times 3 \\
 \hline
 3459 \\
 +384 \text{ original number} \\
 \hline
 3843
 \end{array}$$

*Estimate of author

GAME #26
GERM WARFARE
(60:37)

OBJECTIVE: Representing a bacterium, each player tries to move around the board to the goal, "Infection and Disease."

RULES: The board is a path beginning with "Exposure" and ending at "Infection and Disease" with several spaces in between. The spaces are of three types, free, pathogen, and host responses. Each player is represented by a token, possibly in the various shapes of bacteria. Dice are rolled to gain entry; after entry, only one die is rolled. If the player lands on a free space, he does not draw. Host response and pathogen spaces require drawing from piles of cards of the same names. These cards contain clues and instructions. The first player to reach "Infection and Disease" wins.

PREPARATION: Designing board and cards (see Examples).

MATERIALS: Dice, cards, board, tokens.

AGE LEVEL: Junior high school through adult.*

VALUES: Reinforces microbiological concepts. Develops good attitudes toward healthful concepts. Relates subject matter to the real world.

EXAMPLES OF ENTRY ROLLS:

- Roll 2 - No entry. Antiseptics on the skin prevent entry.
- Roll 3 - Entry. Ingestion through the mouth.
- Roll 4 - No entry. Drinking water disinfected by chlorine.
- Roll 5 - Entry. Enter through a vector (e.g. ticks, fleas, raw meat)

EXAMPLES OF PATHOGEN CARDS:

- 1) Inflammatory response - clots are formed which localize infection. Lose next turn.
- 2) Stomach acids digest you. Return to "Exposure" and reenter.
- 3) You produce enzymes which dissolve clots. Move ahead two spaces.
- 4) Phagocytes engulf you. Lose one turn.

EXAMPLES OF HOST RESPONSE CARDS:

- 1) Your host has been filling up on junk foods - his resistance is low. Move ahead three spaces.
- 2) Your host takes prescribed antibiotics - your growth is retarded. Move back three spaces.
- 3) Your host has another minor infection - his resistance is low. Move ahead two spaces.

*Estimate of author

GAME #27
COLLEGE BOWL OF CURRENT EVENTS
(75:74-80)

OBJECTIVE: To outscore the opposing team by answering questions relating to current events.

RULES: The game is based on the old television show College Bowl. With the class divided into teams of 4 to 6 members, ask a "round" of four questions. Each team discusses them quietly and writes the answers on a sheet of paper. The instructor collects the responses and gives 10 points to the team with the correct answers. Following each round, auction a bonus question on a general topic. Each team writes down the number points it wishes to bid. Teams may not bid more points than they have. The instructor poses the question to the team which bid the highest and they discuss it and answer aloud. The team which has the highest point total after a specified time or number of rounds is the winner.

PREPARATION: Make publications like Newsweek, Time, and U.S. News and World Report available. Prepare questions ahead of time.

MATERIALS: Pencils and paper

AGE GROUP: Game could be adapted to any age group.

VALUES: Encourages students to become knowledgeable about the subject.

EXAMPLE TOPICS: Unemployment, campaign contributions, southern politics, entertainment

VARIATION: The game could be adapted to a number of subjects or disciplines. Use text questions during the game.

GAME #28
DIALOGUING JIGSAW GMAE
(67:249-252)

OBJECTIVE: To convert written material into idiomatic and structured speech patterns in the form of situation-based exchanges.

PROCEDURES:

- 1) The instructor should select a reading passage which has distinct events which lend themselves well to transformation into dialoguing topics.
- 2) Challenge the students to spot and name the various moments in the story which could become speaking situations.
- 3) The class is broken into groups of 2 or 3 and each group chooses a topic for dialogue. Each group must follow these rules:
 - a) they must follow the story line but may elaborate upon it;
 - b) they must employ a range of grammatical structures (reviewed beforehand) and appropriate social functions (greeting, inviting, requesting, etc.);
 - c) they have 45 minutes for their dialoguing;
 - d) exchanges are to be written out and then read in sequence to the entire class;
- 4) Students read their dialogues.
- 5) Dialogues should be taped or the written dialogue kept for analysis and correction.

MATERIALS: Paper and pencils, stories from books or magazines, tape recorder and tape (optional)

AGE GROUP: Junior high school through adult.

- VALUES:
- 1) Combines autonomous and creative group work with strong syntactic and lexical guidance.
 - 2) Encourages interest in writing.
 - 3) Allows students to try out what they have mastered in a creative way, while furnishing material for follow-up work in the future.
 - 4) Gives a meaningful linguistic task and allows some freedom to work independently but with certain grammatical guidelines and a sense of direction provided by the story.

GAME #29
DOMINOES
(7:170-195)

Dominoes originated in China perhaps as long ago as 2000 years. It is an extremely fun and often very competitive activity.

Most set of dominoes contain rules for several variations of the game and since dominoes must be purchased, rules for the various games are not given here. However, Bandreth gives an excellent discussion of the history, general principles, terminology and over twenty different games of dominoes.

Dominoes are excellent for developing basic arithmetic skills.

GAME #30
EQUALITY
(55:8)

OBJECTIVE: Each player should end up with the same score. (This is a cooperative game.)

RULES: All the cards from a standard deck are dealt. The first player leads a card and other players follow suit. The player with the high card takes the trick and places in front of him, face up, any ace, 2, 3, 4, or 5 that has been taken in the trick. All other cards are discarded. He then leads the next trick. The play continues in such a way as to attempt to give the trick to the player who needs the correct number of points for his part of the score. The number of points showing in front of each player is his score. In order to achieve success, the players' totals should be equal.

PREPARATION: None

MATERIALS: One deck of cards.

AGE GROUP: Elementary through junior high school.*

VALUES: Teaches arithmetic skills; teaches cooperative attitudes.

VARIATIONS:

- 1) To make the game simpler, require the number of tricks to be equal.
- 2) To make the game more difficult, require the player who wins the trick to count the highest card taken toward his total. Jack is 11, Queen is 12, King is 13, Ace is 14 or 1.
- 3) Have the players bid on the number of tricks they will take. The total number of tricks is 13. Success is achieved if each player wins his bid.

*Estimate of author

GAME #31
IMAGINARY VACATIONS
(79:272)

OBJECTIVE: To plan three two-week vacations from start to finish.

RULES: Each student is to plan three two-week vacations, one to a place within his home state, one to a place outside the state but inside the U.S., and one outside the U.S.

PREPARATION: None

MATERIALS: Maps or atlases, travel flyers, encyclopedias, etc. should be available to students.

AGE GROUP: Junior high school through high school and some college geography classes.*

VALUES: Demonstrates that geography is a relevant subject to the students, encourages interest in people and areas outside the immediate, and develops library and map skills.

*Estimate of author

GAME #32
METABOLISM

OBJECTIVE: To acquire sufficient energy from carbon compounds to survive.

PROCEDURES: Representing a living cell, each player faces the problem of acquiring energy from carbon compounds. Players move tokens representing carbon atoms through various enzymatic reactions, thereby generating ATP.

PREPARATION: None

MATERIALS: This game is produced commercially by Carolina Biological Supply Company.

AGE GROUP: High school through college.

VALUES: Provides enjoyable way to learn about cellular respiration.

GAME #33
JEOPARDY
(82:195)

OBJECTIVE: To score the most points by providing the appropriate question to match the answer.

RULES: Two to four players are the most convenient numbers. A game board is developed. Columns should have the categories of the answers contained therein. Rows should be of differing point values. The board is most effective if it is 4 x 4 (16 answers) or 5 x 5 (25 answers). The player calls out a category and point value. When the answer is revealed the first player to ring his bell has a chance to ask an acceptable question which would have the word or phrase as its answer. If the question given is incorrect, other players may ask a question; if it is correct, that player may select the next category and point value. The highest point total wins.

PREPARATION: The teacher must prepare the board and the answers on large index cards.

MATERIALS: The board may be as large and elaborate as one wishes.

AGE GROUP: Kindergarten through adult.

VALUES: Encourages study of the subject.

EXAMPLE: Subject - American history; Answer - President of the Confederate States of America; Correct question - What title did Jefferson Davis hold during the Civil War?

GAME #34
BLOOD FLOW

OBJECTIVE: To race around the board to return the carbon dioxide token to the lung.

PROCEDURES: Game board is printed with the major blood vessels and capillary beds. Pieces include die, red blood cell tokens, and carbon dioxide tokens. Players follow the major blood pathways and must contend with various factors affecting the blood flow. Oxygen is picked up in the lungs and carried to a capillary bed where it is exchanged for carbon dioxide. The first player to return the carbon dioxide token to the lung is the winner.

PREPARATION: None

MATERIALS: This game is produced commercially by Carolina Biological Supply Company.

AGE GROUP: Grades 6 through college.

VALUES: Teaches the major blood pathways, the oxygen-carbon dioxide relationship, and factors which affect the blood flow.

B. SIMULATIONS

SIMULATION #1
THE FAMILY GAME
(19:116-7)

OBJECTIVE: To score higher than others in your role (parent or child).

PROCEDURES: In one version of the game, the child has two behavior alternatives for each of five issues that must be resolved. One alternative is preferred by the parent, the other by the child. However, the strength of preference varies from issue to issue. The parent's score is determined solely by the child's eventual acts--which are indicated by the child on a playing board. The child's score is determined by his own behavior and by whether he receives any parental punishment.

The game consists of several rounds, each of which begins with a few minutes discussion between parent and child. At this point, they try to reach agreement on how the child will behave. When the two cannot reach agreement on an issue, the parent gives an order to the child on how he is to behave. Afterwards, the child selects his behavior; he may violate agreements or disobey orders. The parent, however, can then administer punishment, which causes points to be subtracted for the child's score.

In the scoring, parent and child do not compete against each other, but parent against parents and child against children who are playing at other boards. The exercise is intended to demonstrate that domestic peace can be established by a system of bargaining in which both sides recognize the wisdom of compromise and adherence to agreements.

PREPARATION: None

MATERIALS: This simulation is produced commercially.

AGE GROUP: Junior high school through adult.*

VALUES: Provides understanding of the family structure, its power and interdependence; helps players to shape effective strategies for handling family conflicts.

*Estimate of author

SIMULATION #2
CONSUMER
(19:115-6)

OBJECTIVE: To manage resources so that one maximizes his utility points and minimizes credit or interest charges.

PROCEDURES: Players (consumers) receive a monthly income with which they may buy products. Situations arise similar to those in real life. For example, accidents or unemployment may arise at random.

The players must weigh the added cost of financing a purchase against the additional value to them of having the item now. They must compare interest rates charged by different financial institutions. However, situations may be complicated by the need to pay an emergency bill, buy a product, etc.

PREPARATION: None

MATERIALS: This simulation is produced commercially.

AGE GROUP: Junior high school through adult.*

VALUES: Learning about economics and installment buying and experiencing the effects of unexpected events.

*Estimate of author

SIMULATION #3
COMMUNITY DISASTER
(19:114-5)

OBJECTIVE: To react to a disaster in the most efficient and cooperative manner.

PROCEDURES: The players are informed that a catastrophe has taken place in an unspecified section of town and that people many have been injured and property destroyed. Each player is assigned a role complete with his starting location, job, friends and relatives, and special obligations and interests.

Players may try to find out what has happened by radio, telephone, agencies, word of mouth, or personal observation. However, each such activity requires the expenditure of energy units. Players will see how much of the action is a result of their own decisions and actions. For instance telephones circuits may overload and high-ways jam.

Organization of the community becomes necessary when the extent of damage and location of the disaster area is ascertained. If the community cannot organize itself quickly or efficiently enough, the disaster can spread. Certain activities such as fire fighting and evacuation must be carried out.

At the end of the game, the players elect from among the three with lowest "anxiety" scores the one who was most valuable to his community. The winner is the player who was most efficient in the usage of his own energies and most cooperative in helping neighbors.

PREPARATION: None

MATERIALS: This simulation is produced commercially.

AGE GROUP: Junior high school through adult.

VALUES: Develops a familiarity with reactions of people in disasters and develops problem solving techniques.

SIMULATION #4
ASSEMBLY LINE
(74:200-216)

OBJECTIVE: To participate in the actual operation of an assembly line and produce a large number of cars.

RULES: Assembly Line is a very complicated simulation. The total explanation of the operation of this experience is beyond the scope of this project. The reader is encouraged to read the citation above. However, a brief description of the simulation is provided.

The simulation can be adapted for groups of 8 to 60 in size. Some of the roles are tracers, fine cutters, gluers, inspectors, line mechanic, line supervisors, and accountance. The players have their objective to produce automobiles made of paper on their own assembly line. Each player has a role with its own expectations and responsibilities.

During the simulation, a number of problems arise. The players are to work out these problems themselves if possible.

PREPARATION: The leader should decide role assignments and prepare the materials (provided in citation). The leader should also practice the various skills involved in the exercise and plan in his own mind the degree of involvement he will undertake when problems arise.

MATERIALS:

- 1) Tables and chairs or desks with legs on outer corners to permit conveyor to pass on the floor beneath.
- 2) One to two feet wide roll of butcher paper for conveyor belt.
- 3) Scissors.
- 4) Paste or glue.
- 5) Tag board for car templates to be used with colored construction paper, or dittos and white construction paper.
- 6) Pencils for tracing templates on colored construction paper or crayons for "painting" cars on dittoed white construction paper.
- 7) Tape.

AGE GROUP: Any age above 6.*

VALUES:

- 1) Provides first-hand experience with varying attitudes and feelings that are a part of highly mechanized society.
- 2) Displays the modern consequences of specialization.
- 3) Provides insight into social consequences that lead to such things as disappearance of old jobs and appearance of new ones.
- 4) Provides players with simulated opportunities to undergo many assembly line working conditions such as lack of contact with the final product, boredom, demands to speed up or slow down, and the

*Estimate of author

responsibilities of a "work-a-day world."

- 5) Develops problem solving skills.

VARIATIONS:

- 1) Allow groups to compete with one another.
- 2) Design auxiliary companies to produce the rubber, steel, etc. to make the automobiles.
- 3) Incorporate the economic aspect of production by estimating costs in terms of materials, man-hours, etc.

SIMULATION #5
LEGISLATION
(24:69)

OBJECTIVE: To be reelected to office by the largest margin.

RULES: Six to eleven players sit around a table or circle of desks. The chairman deals a set of 52 cards, each representing a segment of a constituency. Each card contains the position of the constituents on some or all of eight issues: civil rights, aid to education, medical care, defense appropriation, national seashore park in Constituency A, offshore oil, federal dam in Constituency B, and retaining a military base in Constituency C.

Each legislator is attempting to be reelected and must satisfy the wishes of a majority of his constituents in order to do so.

After a player brings an issue to the floor, a two-minute negotiation session ensues. The negotiation consists mostly of an exchange of support among the legislators. A legislator will offer his support for or against an issue in which his constituents have no interest, in return for support on legislation in which they are interested. A vote is taken on the issue at hand with each legislator getting one vote. The session then proceeds to the next issue. After all the bills have been acted on, each legislator calculates his reelection or defeat by adding up votes of satisfied and dissatisfied constituents. The overall winner is the legislator who is reelected by the largest margin. There are eight progressively complex levels of legislative functioning.

PREPARATION: None

MATERIALS: This simulation is produced commercially.

AGE GROUP: High school through adult.

VALUES: Teaches the basic structure of representative government.

SIMULATION #6
A COMMUNITY AT THE CROSSROADS: A DRUG EDUCATION
SIMULATION GAME (THE SOCIAL SEMINAR*)

OBJECTIVE: To experience the problems of a community faced with a problem.

DESCRIPTION: This simulation requires at least 20 players and 2-5 hours. It is a role-playing exercise about a community facing the problem of local drug abuse.

PREPARATION: Takes about an hour of planning and assignment of roles.

MATERIALS: This is a packaged simulation.

PRODUCER: National Institute of Mental Health, Rockville, Maryland

AGE GROUP: Adults

VALUES: Much can be learned about the participants' own and others' opinions and feelings about drug abuse. The game allows experience in working with others to solve a problem.

*The author has a copy of this simulation game and would loan it to interested parties.

SIMULATION #7

HELP!

(47:15)

OBJECTIVE: To react to crises and solve the related problems.

DESCRIPTION: This game places students in household emergency situations to which they must react. It consists of 32 crisis cards, eight for each of the following types of emergencies: fire, police, medical, and miscellaneous.

PREPARATION: None

MATERIALS: This is a packaged game.

PRODUCER: Games Central, 55-C Wheeler Street, Cambridge, Massachusetts 02128

AGE GROUP: Elementary school

VALUES: Develops problem-solving skills, teaches emergency reactions.

EXAMPLE CRISIS: "#23 - you have just settled down to read your favorite book ... your mother has gone out for a while, but you can't leave because you have to look after your little brother (sister) ... Everything is quiet for a while. Somehow that makes you wonder, because your little brother (sister) is not usually quiet. Be he (she) has found something to play with, and you go back to reading. All of a sudden you hear little brother (sister) crying ... you find your little brother (sister) lying in front of an electrical socket ... he (she) is just lying on the floor twitching ... What do you do now?"

VARIATION: Rewriting some crises situations could well adapt them to adult situations, including staff development activities and such courses as transportation.

SIMULATION #8
LIVER TRANSPLANT
(50:126-131)

OBJECTIVE: Given a description of 7 people, select the 3 most logical choices to receive a liver transplant and therefore to live.

RULES (PROCEDURES): Four or more people can participate. Groups of 4 to 7 are most effective.

1) Distribute the following LIVER TRANSPLANT scenario to the participants:

SCENARIO FOR THE LIVER TRANSPLANT SIMULATION

INSTRUCTIONS: You have been chosen to serve on a hospital committee to decide which of seven applicants are to receive a liver transplant. The operation for transplanting a pig liver into a human has been improved to the point that it is now possible for the first time to save the lives of people who would otherwise die of liver diseases. Your hospital is the only one in the world where this operation can be successfully performed. Because the procedure is so costly and complex, however, only three transplants can be performed each year. You must choose, therefore, only three of the seven applicants.

Keep in mind three important considerations:

1. The applicants are all suffering from a rapidly growing liver tumor. Without a liver transplant all will die within a year.
2. No one can share a liver with anyone else.
3. You are the final authority in this case-you cannot delegate the decision to anyone else.

SEVEN APPLICANTS:

1. White 29-year-old female bank robber with 6 children, the oldest of whom is 12 years old; on welfare since she was released from prison last year.
2. White 70-year-old Swiss businessman (manufactures watches). Family will donate \$3,200,000 to research on liver diseases if he is chosen to get a transplant.
3. Seventeen year-old delinquent with a high IQ but a 3-year drug (nonaddictive) history; currently unemployed.
4. White female physician 54 years old-works half time in community health clinic; her other work involves research on vaccines for infectious diseases; had mild attack 2 years ago.
5. Black female college scholarship student, age 21, who is carrier of sickle-cell anemia.
6. Male musician, age 36, famous concert violinist and teacher.
7. Oriental male orphan, 4 years old; otherwise healthy and seemingly bright.

- 2) Ask each person to read the sheet and decide individually which 3 applicants he chooses to receive liver transplants. Encourage players to jot down notes as they decide. Allow 5 to 10 minutes.
- 3) After all participants have indicated their decisions, group them into committees of 4 to 7.
- 4) Ask each committee to decide by consensus which 3 applicants will receive liver transplants. Allow 20 to 35 minutes. Write the following guidelines on the board:
 - a. Avoid arguing for your own individual judgments.
 - b. Avoid changing your mind only to reach agreement or to avoid conflict.
 - c. Avoid conflict-reducing techniques such as majority vote, averaging, or trading in reaching a decision.
 - d. View differences of opinion as helpful to good decision-making.
 - e. Approach the task with reason and logic.
- 5) Post the results of each committee's decision.
- 6) Talk with the participants about what happened. Discuss how it felt to have the power of life or death; what makes a person worthwhile to save; your criteria for selection; whether it was difficult to reach a consensus decision and why; how you handled differences of opinion in your committee; what roles in life force such decision-making.

MATERIALS: Blackboard or easel, copies of scenario, pencil and paper.

AGE GROUP: High school through adult, especially professionals.

VALUES: Gives experience in decision-making, both committee and individual.
Raises moral questions concerning a person's worth.

SIMULATION #9
STRAWBERRY BOX GAME*

OBJECTIVE: To manufacture the greatest number of strawberry boxes possible.

RULES (PROCEDURES):

- 1) Divide the group into "companies" of 4 or 5 people.
- 2) Each company receives an unlimited number of computer cards (or envelopes) and a stapler with plenty of staples.
- 3) Demonstrate the use of 4 cards to construct a strawberry box.
- 4) Allow 10 minutes to plan strategy.
- 5) Allow 5 minutes for the companies to manufacture as many strawberry boxes as possible.
- 6) Announce the number of boxes manufactured by each company.
- 7) Allow 10 more minutes to revise strategy.
- 8) Allow 5 minutes for production of boxes.
- 9) Announce the number of boxes manufactured by each company.
- 10) Discuss the strategies used, the changes in strategy, and the decision making process.

PREPARATION: Acquiring materials

MATERIALS: Hundreds of computer cards or envelopes, staplers, staples

AGE GROUP: Junior high school through adult.**

VALUES: Gives experience in group activity, decision making and cooperation.
Particularly beneficial for new or potential administrators.

VARIATION: Allow a day between first and second trial of manufacturing.

*The original reference for this game is unknown. It was first played by the author in a graduate course in Educational Administration.

**Estimate of author.

SIMULATION #10
AGING SIMULATION MIND GAME
(70:45)

OBJECTIVES:

- 1) To give a futuristic perspective to the life and life-style of the individual student,
- 2) To simulate mentally and apply personally an experience of growing old by painting a positive picture of one's older years, and
- 3) To clarify ways students can help make an older person dear to them enjoy life.

RULES (PROCEDURES): Prepare students by having them lie down without touching anyone else. Turn off or dim lights and ask students to close their eyes. Use an abbreviated relaxation technique such as concentration on specific parts of the body, tensing the muscles for five seconds in those areas and then concentrating on relaxing them. When students are totally relaxed, the teacher should say the following monologue in a soft mellow voice: "Now that you are totally relaxed, I am going to take you on a trip through the future - your future. It will be a pleasant experience, one you will cherish. Imagine yourselves at high school graduation. First, look at yourself in your cap and gown. (Pause) You can hear the music as you march before family members and friends and receive your diploma (A tape recording of "Pomp and Circumstance" is effective here.) (Pause). You can see your friends and the thought of leaving them saddens you. (Pause) Imagine now a profession you would like to pursue and take a few moments to live through the training you need to become one of the best in that profession. (Pause a couple of minutes). Imagine now an ideal partner, someone you would like to share your life with. Imagine meeting the person, dating, courting, and finally making a commitment to that person. Feel the powerful love shared between the two of you. (Pause a few minutes.) Imagine excelling at what you do as a profession (pause). Your love continues to grow with your partner and perhaps you have children. Imagine the beautiful children you have (pause). Imagine now the ideal lifestyle you have in your middle years - things you do, feel and see (pause). Reflect on your spiritual state, your closeness to nature (assuming the spiritual dimension is treated). In your life, now move toward your retirement years, imagine how you are financially stable, ready for retirement and imagine the things you will want to do (pause). Reflect on how fit you are for your age, on the types of exercise you do. Now you retire. You are now in your 80's. (Pause) Imagine all the positive things you want to do in your 80s. (Pause) Imagine all the things you want to do with your children and grandchildren at this age. (Pause) They respect you, people

still seek your advice, and you still have many friends. Your spouse may die, you grieve but you realize the fulfilled life was well worth living. You miss your partner. (Pause) Imagine how full your life can still be, even without your partner. (Pause) You are proud of what you have done. Life is fulfilling. Now return to your present age. Open your eyes."

Discussion ideas:

- 1) Share with the class the activities of your productive years at retirement.
- 2) Describe visits by your grandchildren.
- 3) How can you now help someone dear to you, who is perhaps retired, to live a more qualitative life?

EQUIPMENT: None

AGE GROUP: High School through adult.

VALUES: The simulation provides practical, ethical experiential learning activity. It achieves for experiential learning the quality of affective experiences.

VARIATION: Provide similar simulation mind games involving drug trips, death and suicide. See simulation #11. Since this monologue is geared to white, middle class, high school population, it will be necessary to adapt the monologues to your own school population.

SIMULATION #11
LIFE AFTER DEATH SIMULATION MIND GAME
(70:45-6)

OBJECTIVE: The simulation allows students to visualize events surrounding death similar to those described by patients who have had death-like experiences.

RULES (PROCEDURES): Prepare students by having them lie down without touching anyone else. Candles in a dark room provide an appropriate atmosphere. Use an abbreviated relaxation technique such as concentration on specific parts of the body, tensing the muscles for five seconds in those areas and then concentrating on relaxing them. When students are totally relaxed, the teacher should say the following monologue in a soft mellow voice: "Today you are going to experience death, not as a terrifying end but as a natural part of life, a transition stage. On my command you will experience death and at that moment you will see yourself rise to the ceiling of this room and look down upon your own lifeless form. You will die now. As you look upon your body you are not frightened, just feeling a little awkward in your new state of being. You are interested as people try to revive you, but not upset. You can see loved ones who hear the news of your death and mourn. Try to reassure them that you are content in your new state. Some of them feel your presence and are reassured. You now return to your body again and look at it for the last time. You hear a buzzing noise and with the noise you feel yourself going through a long dark tunnel at tremendous speed. As you approach the end of the tunnel it opens into a beautiful spot. You see rolling, grassy meadows. On the right you see beautiful trees. On the left is a crystal clear lake. Some of your favorite animals are at play. Take a few moments to hear the sounds, feel the gentle breeze, and smell the fragrance of this beautiful spot (pause.) In the distance you see people approaching you, and they are singing beautiful songs (taped music is effective here). As they approach, you recognize relatives and friends who have already died. You recognize great grandparents whom you have never seen perhaps, but you know them now. You embrace some of these relatives. Then there is a hush, and a being of light approaches you. The power of love you feel from this being is overwhelming. You feel choked up inside and tears come to your eyes, so powerful is the love this being has for you. The being embraces you and you almost melt within those strong arms. Enjoy the moment (pause.) This being now communicates with you but without words and you now have a panoramic playback of your whole life from infancy to the present. Enjoy that playback. (Be sure to allow enough of a pause for this.) You are given a choice by the being to stay or return (short pause). You want to stay in the beautiful state but you realize that you have a purpose to fulfill, so you decide to return. Suddenly you are back in your body alive. Before opening your eyes, you are

struck with a number of feelings. What is surprising is that what seemed like hours has been but a few minutes. But more importantly, you feel a tremendous desire to show, give and receive love. Also, you are impressed with a need to seek knowledge in all its form." Discussion ideas:

- 1) How many were able to visualize the experiences of this mind game?
- 2) Do you feel death could be as wonderful as the scenario?
- 3) Do you think a suicide or violent death would yield as pleasant an experience?

MATERIALS: None

AGE GROUP: High school through adult.

VALUES: This technique can produce stimulating discussion. It provides practical, ethical experiential learning of the affective.

VARIATION: Provide similar simulation mind games involving disabilities, emotional health changes, futuristic environmental adaptations, etc. The monologues may have to be adapted to the school population. See simulation #10.

SIMULATION #12
BLUE BIRD
(11:68)

OBJECTIVE: To make career decisions in the most effective way.

PROCEDURES: A Career Chart is used to plot career decisions and their effect on lifestyle. Players explore job and home career decisions and consequences in unskilled, semi-skilled and skilled categories. Players must make decisions on union membership, further education and training and etc.

PREPARATION: Discussion on career choices is helpful.

MATERIALS: This simulation is produced commercially by Games Central.

AGE GROUP: Junior high school through adult.

VALUES: Allows students the experience of making career decisions before they enter the "real world." Builds a sense of efficacy.

SIMULATION #13
LOST ON THE MOON
(76:44-9)

OBJECTIVE: To rank order 15 items which may be useful to a party crashed on the moon.

RULES: Distribute to each member of the group a copy of the following problem:

"You are in a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. Mechanical problems, however, have forced your ship to crashland at a spot some 200 miles from the rendezvous point. The rough landing damaged much of the equipment aboard. Since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile trip. The fifteen items left intact after landing are listed below. Your task is to rank them in terms of their relative importance to your crew in its attempt to reach the rendezvous point. Place the number 1 by the most important item, number 2 by the second most important item, and so on."

- _____ a. Box of matches
- _____ b. Food concentrates
- _____ c. 50 feet of nylon rope
- _____ d. Parachute silk
- _____ e. Portable heating unit
- _____ f. Two .45 caliber pistols
- _____ g. One case dehydrated milk
- _____ h. Two 100-pound tanks of oxygen
- _____ i. Stellar map of the moon's constellation
- _____ j. Life raft containing CO₂ bottles
- _____ k. Magnetic compass
- _____ l. 5 gallons of water
- _____ m. Signal flares

- _____ n. First-aid kit containing injection needles
- _____ o. Solar-powered FM receiver-transmitter

The rankings given by NASA are: A-15 (little or no use on the moon), B-4 (supply daily food requirements), C-6 (useful in tying injured, help in climbing), D-8 (shelter against sun's rays), E-13 (useful only if party landed on dark side), F-11 (self-propulsion devices could be made from them), G-12 (food, mixed with water for drinking), H-1 (Fills respiratory requirement), I-3 (one of principal means of finding directions), J-9 (CO₂ bottles for propulsion across chasms, etc.) K-14 (since no magnetized poles, useless), L-2 (replenishes loss by sweating, etc.), M-10 (distress call within line of sight), N-7 (oral pills or injection medicine, etc.), O-5 (distress signal transmitter, possible communication with mother ship).

Find the difference between rankings by NASA and by student for each item. Total the differences. Lowest total is the best.

PREPARATION: Copies of problem.

MATERIALS: Copying machine, paper.

ACE GROUP: Upper elementary through adult.*

VALUES: Develops analytic and problem-solving skills.

VARIATION: Use groups, requiring a consensus on the rankings without taking a vote.

*Estimate of author

SIMULATION #14
ABOLITION: AN AMERICAN HISTORY SIMULATION GAME
(11:45)

OBJECTIVE: To interact among several factions who were prominent around 1850.

PROCEDURES: Assigned the roles of abolitionists, local government representatives, and the various members of the public sector, students interact with each other on issues such as the morality of slavery, states rights versus federal power, prejudice and economic stability. A town meeting on the slavery question and a court trial on desposition of a fugitive slave ensue.

PREPARATION: None

MATERIALS: This simulation is produced commercially by Random House/Singer.

AGE GROUP: Junior high school through adult.

VALUES: Allows students to experience debate on social issues. Provides viewpoints on historical issues.

SIMULATION #15
BALANCE
(11:63)

OBJECTIVE: To survive in a simulated ecosystem with the least amount of injury to the environment.

PROCEDURES: The first round allows players to simulate the last 150 years' history of an American geographical area. Players assume roles of animals and Indians who live in harmony with the environment, and settlers who abuse the wilderness, killing animals and Indians as their numbers multiply.

Players divide into groups living in their growing city with a number of ecological problems. Each family is forced to make decisions which tests its ability to balance short term goals with long term environmental goals.

PREPARATION: None

MATERIALS: This simulation is produced commercially by Interact.

AGE GROUP: Junior high school through adult.

VALUES: Introduces the concept of an ecosystem and man's role in destroying or maintaining it. Allows for decision making practice involving economic-hedonistic short term goals and long term environmental goals.

SIMULATION #16
THEY SHOOT MARBLES, DON'T THEY?
(47:9)

OBJECTIVE: Objectives change with game variations.

PROCEDURES: The game begins with a minimum of structure and two rules, on the basis of which the players define and redefine the rules and goals of the game. The game can have many variations and interpretations. The beginning scenario is five players sitting around a board representing private citizens involved in their daily routines. Marbles represent whatever the players perceive as important to survival, e.g., money, power, or skill.

In the bargaining session, the players bargain for a pot of marbles. Held marbles represents bargaining power. Using wooden dowels, players build a tower to symbolize the bargain. In the shooting round, the players have the option of toppling the bargain tower, thus nullifying the bargain, or shooting at job marbles scattered around the board which return an income. Players must shoot from designated positions and avoid hitting trouble marbles. A police is established to enforce these rules. In addition, a government exists to set up laws and apply justice.

PREPARATION: None

MATERIALS: This game is produced commercially by Urbex Affiliates.

AGE GROUP: Grade 4 through adult.

VALUES: Because there are many ways to play the game, many lessons can be taught.

SIMULATION #17
STAR POWER
(47:463-4)

OBJECTIVE: To accumulate and exercise political power.

PROCEDURES: The game begins with a distribution of chips of five different values by each player selecting five chips from a bag. A trading session follows in which players trade chips, thus improving other "financial" situations. Players are then segregated into three groups, circles, squares, and triangles. The groups represents three levels of point total.

Groups sit together for a bonus trading session, during which each team receives three chips worth twenty points each. The chips must be distributed within each team by unanimous decision.

During the second round adjustments in the Starpower sequence can be made by the director. He enriches the bags with gold chips in various ways. For instance, he could put all the chips into the rich team's (squares) bag, thus making the rich get richer. A second bonus session follows.

At the end of the second bonus point session, the director congratulates the Squares on their achievement, implying that they have achieved their station because of ability.

The Squares are now bestowed with political power so that they can legislate and change any rules of the game. The Director announces that the three players with the highest numbers will eventually be declared winners. Another rule permits majority of any group to eliminate a minority by simple vote. Therefore, the rich group can prey on the other groups, Circles and Triangles, and eventually the Squares must turn on themselves.

PREPARATION: None

MATERIALS: This simulation is produced commercially by Simile II.

AGE GROUP: Grade 1 through adult.

VALUES: After generating small social systems, students explore how the system shapes human behavior and decision-making. They also learn some of the truths and half-truths about organizations and bureaucracies, as well as discovering some things about themselves and others.

V. RESOURCES

The following is a list of companies, center, institutes, and individuals who produce games and simulations for education. Examples of games or simulations are given; in some cases more detailed information is given. An asterisk (*) indicates an organization which produces computer-oriented material.

1. ABT Associates, Inc.
55 Wheeler Street
Cambridge, Massachusetts 02138

Culture Contact
Health Education Planning Game
Rural Health

Principal Focus: Research, social program evaluation, classroom education, and training for social action

Principal Subject Matter: Education, housing, drug abuse, poverty, urban problems, technology management, environmental problems

Training Levels: Elementary grades through college and adult.

2. Academic Games Associates, Inc.
430 East 33rd Street
Baltimore, Maryland 21218

The Drug Debate
Trade and Develop
The Classroom Games
High School

Principal Focus: Design and development of simulation games for teaching and training

Principal Subject Matter: General

Training Levels: Elementary through adult.

3. Mr. James Adams
8443 Brett Lane
Columbia, Maryland 21045

The Game of Future Shock

4. Addison-Wesley, Inc.
Reading, Massachusetts

Federal Reserve System Game

5. Adult Leisure Products
P.O. Box 465
Locust Valley, New York 11560

Trial!

6. Allyn and Bacon
Rockleigh, New Jersey 07647

Simulating Social Conflict
7. American Forest Institute
1619 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Possum Creek Valley
Indian Valley
8. American Universities Field Staff, Inc.
3 Lebanon Street
Hanover, New Hampshire 03755

Developing Nation
Territory: A Simulation of Colonialism
Bazaar
Power
9. Paul S. Amidon and Associates, Inc.
4329 Nicollet Avenue, South
Minneapolis, Minnesota 55409

Mulberry
Wheels
10. Antler Productions
11209 LaMaida Street
North Hollywood, California 91601

The Peter Principle Game
Prime Time
Beat Detroit
11. Appleton-Century-Crofts
440 Park Avenue, South
New York, New York 10016

Language Lotto
Matrix Game
Perceptual Learning Puzzles
12. Artco, Inc.
Chicago, Illinois

Art Gizmo

13. Art Fair, Inc.
18 West 18 Street
New York, New York 10011

Ethics

14. Audio-Visual Center
Indiana University
Bloomington, Indiana 47401

Human Relations: One Dimension of Teaching

15. Austin Writers Group
P.O. Box 12642
Capitol Station
Austin, Texas 78711

Drug Abuse: A Problem Solving, Decision-Making Program

16. Au-Vid, Inc.
P.O. Box 964
Garden Grove, California 92642

The Ungame

17. Behavior Development Products
Rt. 2, Box 269
Alta Loma, Texas 77510

Operations

18. Benefic Press
10300 W. Roosevelt Rd.
Estrchester, Illinois 60153

Market

19. *Board of Cooperative Educational Services
845 Fox Meadow Road
Yorktown Heights, New York 10568

Free Enterprise Game
Sierra Leone Development Project
Sumerian Game
Consumer Game

20. The Bobbs-Merrill Co., Inc.
Education Division
4300 West 62nd Street
Indianapolis, Indiana 46268

Ghetto
Democracy
Economic System
Consumer
Generation Gap
Life Career

21. Bowmar
622 Rodier Drive
Glendale, California 91201

Gold Cup Games

22. W. C. Brown Publishing Company
135 South Locust Street
Dubuque, Iowa 52001

Nine Men Plus: Supreme Court Opinions on Free Speech and Free Press

23. Canfield Press
10 E. 53rd Street
New York, New York 10022

New Alexandria Simulation

24. Carolina Biological Supply Company
2700 York Road
Burlington, North Carolina 27215

Oh My Deer
The Cell Game
Extinction: The Game of Ecology
Pollution
Blood Flow
Energy Quest

25. The Center for Curriculum Design
Harcourt Brace, Jovanovich
757 Third Avenue
New York, New York 10017

Micro-Economy

26. Center for Health Games and Simulations
Department of Health Science and Safety
San Diego State University
San Diego, California 92115

Birth Control Simulation Game

Principal Focus: Dissemination of information, research, development

Principal Subject Matter: Health science and safety

Training Levels: Elementary through college

27. Changing Times Education Service
1729 H Street, N.W.
Washington, D.C. 20006

Coalition

Hat in the Ring

The Budgeting Game

Consumer Redress

Invest

Share the Rich

Swindle!

28. John M. Clark, Social Studies Department
School Board of Broward County
3600 S.W. College Avenue
Fort Lauderdale, Florida 33314

The Presidential Role Game

29. Classroom Dynamics Publishing Company
231 O'Connor Drive
Suite B
San Jose, California 95128

Urban America

Confrontation in Urbia

30. Coach House Games
23872 N. Kelsey Road, Box 465
Barrington, Illinois 60010

The Bicentennial Games

31. Comex Research Project
University of Southern California
3601 South Flower Street
Los Angeles, California 90007

Court Policy Negotiations

The Justice Game

Principal Focus: Research, development, adaptation of educational and training simulation exercises; design development and programming of inservice training programs and computerized gaming simulations; evaluation

Principal Subject Matter: Social science, urban, teacher training

Training Levels: College and adult

32. Community Makers, Inc.
13 West 89th Street
New York, New York 10024

The Happening Game

33. *Computer-Assisted Instruction Center
Florida State University
Tallahassee, Florida

Explanation

34. *CONDUIT/Central
P.O. Box 388
Iowa City, Iowa 52240

MACII: Macroeconomic Policy Game
Macroeconomic Policy Simulation
WHARTON
MACWHARTON
MONEY
SIMSTATE
CHEM 200
GENE 1
HARDY

35. Creative Specialties, Inc.
83 Prospect Street
Newton, Massachusetts 02165

Bugs and Loops

36. Creative Studies, Inc.
167 Corey Road
Boston, Massachusetts 02146

Life in Israel

37. The Creative Teacher, Inc.
Box 5187
Grand Central Station
New York, New York 10017

Eco-Cycles

38. Creative Teaching Press, Inc.
1900 South Tyler, Unit 15
South El Monte, California 91733
- Educational Potluck
Numerical Baseball
39. Curriculum Development Associates, Inc.
Suite 414
1211 Connecticut Avenue, N.W.
Washington, D.C. 20036
- Natural Selection
Seal Hunting
40. Damon Education Division
80 Wilson Way
Westwood, Massachusetts 02090
- Dirty Water
Ecology, the Game of Man and Nature
Litterbug
Population
Smog
41. Denoyer-Geppert, Inc.
5235 Ravenswood Avenue
Chicago, Illinois 60640
- Empire
Armada
Negotiation-Convention Game
42. Didactic Systems, Inc.
Box 457
Cranford, New Jersey 07016
- Exercise Communication
The Community
International Trade
The Market
The National Economy
QUBIC (3 Dimensional Tic-Tac-Toe)
- Principal Focus: Development, training
- Principal Subject Matter: General
- Training Levels: General

43. Dynamic Design Industries
1433 North Central Park
Anaheim, California 92802

Body Tally
The Family Game
Society Today

44. Education Ventures, Inc.
209 Court Street
Middleton, Connecticut 06457

Community Decision: Budgets and Taxes
Generation Rap
The Garbage Game
Sacrifice
The Orgami Game
Graphigames

45. Educational Games Co.
Box 363
Peekskill, New York 10566

Election

Principal Focus: Domestic politics, social awareness, manipulative
educational designs and devices

Principal Subject Matter: Social relationships, health and nutrition,
environment, driver education

Training Levels: Elementary through college and adult

46. Educational Insights, Inc.
211 S. Hindry Avenue
Englewood, California 90301

The American Revolution
Social Studies Strategies

47. Educational Methods, Inc.
500 North Dearborn Street
Chicago, Illinois 60610

Lifestyle

48. *Educational Research Council of America
Science Department
164 West Superior Avenue
Rockefeller Building
Cleveland, Ohio 44113

MAZLER (Maze Learning by Rodents)
PHSYN (Photosynthesis Rate)

49. Edu-Game
P.O. Box 1144
Sun Valley, California 41352

Crisis in Middletown
Government Reparations for Minority Groups
National Priorities
Women's Liberation
Exchange - A Stock Market Activity
Human Survival - 2025
Exploring the New World
Preventing the Civil War
First Amendment Freedoms
50. Environmental Protection Agency
1201 CM #2
Washington, D.C. 20460

River Basin Model
51. Family Pastimes
R.R. 4
Derth, Ontario, Canada

Family
Mountaineering
52. *Flying Buffalo Computer Conflict Simulation, Inc.
P.O. Box 1467
Scottsdale, Arizona 85252

Board of Directors
53. The Free Press
866 Third Avenue
New York, New York 10022

The Inner City Housing Game
54. Friendship Press
Distribution Offices
P.O. Box 37844
Cincinnati, Ohio 45140

Catalzer
Dignity
Island
Values

55. Gamed Simulations, Inc.
Box 1747
FDR Station
New York, New York 10022

Community Disputes
COMPACTS: Community Planning and Action Simulation
Much Ado About Marbles
Welfare Week
Lobbying Game

56. Games Central
55-C Wheeler Street
Cambridge, Massachusetts 02128

Help!
To Drink or Not to Drink
Neighborhood
Strike or Settle
Simpolis
Pollution
Edplan
Edventure
Edventure II
Slave Coast Game
Exploring Careers
Culture Contact

Principal Focus: Classroom education and guidance counselling (all grade levels), materials research and development and publication

Principal Subject Matter: Math skills, language arts, and especially social studies

Training Levels: Grade 2 through college

57. Games Research, Inc.
500 Harrison Avenue
Boston, Massachusetts 02118

Convention!
Insight

58. Garrard Publishing Company
1607 N. Market Street
Champaign, Illinois 61820

Consonant Lotto
Group Sounding Game
Group Word Teaching
Happy Bears
Know Your States

59. Ira M. Garvin
347 William Street, West
Hampstead, New York 11552

The Game of Peace

60. Ginn and Co.
Xerox Education Center
P.O. Box 2649
Columbus, Ohio 43216

Bottleneck
City Hall
Influence
Ninth Justice

61. Good Time Educators
c/o Bob Reinke
Rte. 2
Monticello, Minnesota 55362

Production
Scarcity and Allocation
Scarcity and the Market

62. Graded Press
201 Eighth Avenue, South
Nashville, Tennessee 37202

The Banner-Making Game
Ecclesia

63. Graphics Company
P.O. Box 321
Urbana, Illinois 61801

The Calorie Game
The Nutrition Game

64. Dr. Cathy Greenblatt
Rutgers University
Douglass College
New Brunswick, New Jersey 08903

Blood Money

65. Greenhaven Press
Box 831
Anoka, Minnesota 55303

Futures Planning Maps

66. Griggs Educational Service
P.O. Box 362
Livermore, California 94550

Biblical Society in Jesus' Time
Moses and the Exodus
New Testament
The Planning Game
Prophets and the Evil
67. Haight-Ashbury Free Medical Clinic
529 Clayton Street
San Francisco, California 94117

The Junkie Game
68. Harwell Associates
Box 95
Convent Station, New Jersey 07961

New Town Educational Kit

Principal Focus: City planning, governmental process, library,
consultation to individuals with subject matter
suitable for simulation

Training Levels: Elementary through college, professional planning
organization and individuals
69. D. C. Heath and Co.
125 Springs Street
Lexington, Massachusetts 02173

Playing Card Number Games
Domino Number Games
Spinner Number Games
70. The Avalon Hill Company
4517 Harford Road
Baltimore, Maryland 21214

Stock Market Game
Origins of World War II
World Power
Tuf
Games of Railroading
71. History Simulations
P.O. Box 2775
Santa Clara, California 95051

Brinkmanship: Holocaust or Compromise
The Haymarket Case

North vs. South
 Radicals vs. Tories
 The Spanish American War

72. Houghton Mifflin Company
 110 Tremont Street
 Boston, Massachusetts 02107

The Planet Management Game
 The Pollution Game
 The Redwood Controversy
 Get Set: Games for Beginning Readers
 The Mouse in the Maze
 Career Insight and Self-Awareness Game

73. House of Games Corporation, Ltd.
 75 West Drive
 Bramalea, Ontario, Canada

Ulcers
 The Game of Nations
 Chessword
 Cube Fusion
 4000 A.D.: An Interstellar Conflict Game

74. Ideal School Supply Company
 11000 South Laverne Avenue
 Oak Lawn, Illinois 60043

Eduviz Science Bingo

75. Information Resources, Inc.
 P.O. Box 417
 Lexington, Massachusetts 02173

Participative Decision-Making

Principal Focus: Development, dissemination of information

Training Level: Adult

76. Institute for the Study of Health and Society Inc.
 1050 Potomac Street, N.W.
 Washington, D.C. 20007

Cooperation and Conflict
 Health Game #1

77. Institute of Urban and Regional Development
University of California
Berkeley, California 94720

El Barrio
Pacific Express
The Woods Game

78. *Instructional Applications of Computers School of Education
University of Massachusetts
Amherst, Massachusetts 01002

PHANTUM

79. Instructional Simulations, Inc.
2147 University Avenue
St. Paul, Minnesota 55114

Impact
Campaign
No Dam Action
System 1
Czar Power
FLIP (Family Life Income Patterns): A Family Budgeting Simulation

Principal Focus: Research, development, training, dissemination of information

Principal Subject Matter: Social studies

Training Levels: Secondary through adult

80. Interact
P.O. Box 262
Lakeside, California 92040

Budget	Balance
Pressure	Enterprise
Votes	Destiny
Amnesia	Panic
Council	Peace
Defense	
Delegate	

Principal Focus: Simulation development

Principal Subject Matter: Social sciences, English

Training Levels: Elementary, middle school, secondary, college adult

81. Joint Council of Economic Education
1212 Avenue of the Americas
New York, New York 10036

Marketplace
Market Game
Wheat Market

82. Judson Press
Valley Forge, Pennsylvania 19481

Using Biblical Simulations

83. Kendall-Hunt Publishing Co.
Dubuque, Iowa

EDUSIM

84. Kohnner Brothers
P.O. Box 158, East
Paterson, New Jersey 07407

85. John Knox Press
P.O. Box 1176
Richmond, Virginia 23209

Agenda
Witherspoon Church

86. LaPine Scientific Company
6001 S. Knox Avenue
Chicago, Illinois 60629

Metri-Magic

87. Learning Resources in International Studies
60 East 42nd Street
New York, New York 10017

The Uses of the Sea
The State System Exercise

88. The Lincoln Filene Center for Citizenship and Public Affairs
Tufts University
Medford, Massachusetts 02115

Conflict in the Middle East

89. Longman Group Ltd.
Resource Unit
9-11 The Shambles
York, England

Malthusania

The French Travel Holiday Game
Longman History Games

90. E. S. Lowe Company, Inc.
375 Park Avenue
New York, New York 10010

Wildlife
Yahtzee

91. The MacMillan Company
866 Third Avenue
New York, New York 10022

Yes, But Not Here
State Legislator
Drawing a Boundary
The Game of Farming
Location of the Metfab Company
Portsville
Remote Island
Rutile and the Beach
Section
Solution for Acme Metal
Reality Games
Stuke

92. MACSCO
P.O. Box 382
Locust Valley, New York 11560

The Verbal Game
Reckon
The Games People Play
Perception Games

93. Markham Publishing Company
3322 West Peterson Avenue
Chicago, Illinois 60645

The State System Exercise

94. Math Shop
New Englander Industrial Park
Concord Street
Holliston, Massachusetts 01746

Mira
Krypto
Shotzee
Napier's Rods and Multiplication Tablets

Action Fractions
 Geometric Figures and Solids
 Tangrams
 Polyominoes
 Clinometer

95. McGraw-Hill Book Company
 Gregg Division
 330 West 42nd Street
 New York, New York 10036

Lester Hill Office Simulation

96. Meridian House, Inc.
 Wesport, Connecticut

Meridian 36

97. Charles E. Merrill Publishing Company
 1300 Alum Creek Drive
 Columbus, Ohio

Pollution Control
 Professional Negotiation in Education
 Questionze

98. Miller Productions, Inc.
 P.O. Box 5584
 Austin, Texas 78763

Commitment Game
 You! Crisis Resolution Games

99. Milton Bradley
 Springfield, Massachusetts

Stamp

100. Minnesota Technical Research
 Box 52
 Prior Lake, Minnesota 55372

Electronic Dominoes
 Electric Bingo

101. Molor Products Corporation
 P.O. Box 709
 Glen Ellyn, Illinois 70137

Magic Number

102. Dr. Robert W. Morgan
Department of Preventive Medicine
University of Toronto
Ontario, Canada

Epidemic
103. MUST, Research Division
Center for Educational Policy and Management
1472 Kincaid Street
Eugene, Oregon 7403

Ernstspiel
104. National Health Systems
Box 1501
Ann Arbor, Michigan 48106

Good Loser
Soup's On
105. Newsweek Education Department
Attn: R. N. Burch, Director
444 Madison Avenue
New York, New York 10022

Futura City
106. Northern Vision Services
77 Swanwick Avenue
Toronto, Canada

Guerilla Warfare
Uhuru
107. *Northwest Regional Educational Laboratory
500 Lindsay Bldg.
710 S.W. 2nd Avenue
Portland, Oregon 97204

CRIMEX
108. Olcott-Forward, Inc.
Hartsdale, New York

Old Cities - New Politics
1787
The Union Divides
109. The Ontario Institute for Studies in Education
252 West Bloor Street
Toronto, Ontario, Canada

Ordering the Elements

110. OXFAM Education Department
274 Banbury Road
Oxford, England

The Aid Committee Game
The Development Game
111. Parker Brothers
190 Bridge Street
Salem, Massachusetts 01970

Monopoly
Clue
QUBIC (3 Dimensional Tic-Tac-Toe)
Soma Cube
112. Pearch Research Laboratory
6251 San Bonita
St. Louis, Missouri 63105

Turn Over
Equality
Fill the Stocking
Heaven
113. People Acting for Change Together
163 Madison
Detroit, Michigan 48226

Horatio Alger (A Welfare Simulation Game)
114. *People's Computer Company
P.O. Box 310
Menlo Park, California 94025

Star Trader
115. Pergamor Press, Inc.
Maxwell House
Fairview Park
Elmsford, New York 10523

Psych City: A Simulated Community
116. Poppin' Swap Game
The Pillsbury Company
Box 60-090 Dept. 377
Minneapolis, Minnesota 55460

Poppin' Swap (Nutritional Game)

117. Project R-3
San Jose Unified School District
1450 Naglee
San Jose, California 95126

Freeway Planning Game
118. Psychology Today Games
P.O. Box 700
Del Mar, California 92014

The Cities' Game
Man and Woman
119. Publisher's Inc.
145 North Highway 101
Solana Beach, California 92075

The Future Time
120. Radius International
321 Parklake Avenue
Ann Arbor, Michigan 48103

At-Isue
Conceptual Mapping Game
Conference Games
General Systems Game
IMPASSE
121. Randa, Inc.
P.O. Box 143
Old Bethpage, New York 11804

Actionanalysis
Teacher Student Interaction Game I
122. Random House
201 East 50th Street
New York, New York 10022

The Hard Rock Mine Strike
The Marriage Game
123. *Sorel Reisman
The Ontario Institute for Studies in Education
Department of Computer Applications
252 Bloor Street West
Toronto M5S 1V6, Ontario, Canada

DOMINOES - A Computer Simulation of Cognitive Processes

124. Rennant Educational Materials
4680 Alvarado Canyon Road
San Diego, California 92120
- Cruel Cruel World Value Game
Helping Hands
Match Wits
My Cup Runneth Over
Value Bingo
125. Saskatoon Learning Center Project
1332 10th Street
Saskatoon, Saskatchewan, Canada
- The Village
126. Science Research Associates, Inc.
259 East Erie Street
Chicago, Illinois 60611
- American Government Simulation Seues
The Congressman at Work
Inner City Simulation Lab
The American Constitutional Convention
American History Games
Inter-Nation Simulation Kit
Inquisitive
Exploring Number and Space
Social Science Library
127. Scott, Foresman and Company
1900 East Lake Avenue
Glenview, Illinois 60025
- Where Do We Live?
Dangerous Parallel
Power
128. SDC
2500 Colorado Avenue
Santa Monica, California 90406
- SDC School System Crisis Simulation
129. Seabury Press
815 Second Avenue
New York, New York 10017
- Down with the King
The Value Game

130. Selchow and Righter Company
2215 Union Blvd.
Bay Shore, New York 11706

Meet the Presidents
Scrabble (School Version)
Scrabble Brand Crossword Cube Game
Scrabble Brand Sentence Cube Game
Tumble Numble

131. The Service Center
7820 Reading Rd.
Cincinnati, Ohio 45237

The Money Game

132. Shelter
86 Strand
London, W.C. 2, England

Sunshine

133. Shinanda Toys
6107 South Central Avenue
Los Angeles, California 90001

Afro-American History Myster Game, Volumes I and II
The Black Experience American History Game

134. Simile II
P.O. Box 1023-G
1150 Silverado
La Jolla, California 92037

Principal Focus: Publication and development of educational simulations
and games

Principal Subject Matter: Social science

Training Levels: Elementary through college levels

Bafa Bafa
Humanus
Sitte
Metropolitics
NAPOLI (National Politics)
Plans
Starpower

135. The Simulation and Games Association
RR #2 Greentree Road
Lebanon, Ohio 45036

Reapportionment

136. Simulation/Gaming/News
Box 3039 University Station
Moscow, Idaho 83843

Cassandra: You are the Survivors!
The Picture Game
Cooperative Work
Hats

Principal Focus: Dissemination of information, literature, materials

Principal Subject Matter: General

Training Levels: All

137. Simulation Learning Institute
P.O. Box 637
Huntington, New York 11743

The Centralized Power Game
The Revolutions Game
Imperialism

Principal Focus: Research, design, publish, direct, train

Principal Subject Matter: Social science, business and management
training, community affairs, education

Training Levels: Kindergarten through adult

138. Simulation Sharing Service
221 Willey Street
Morgantown, West Virginia 26505

325 A.D.

Principal Focus: Development, training, dissemination of information

Principal Subject Matter: General

Training Levels: Secondary through adult

139. Simulation Systems
Black Butte Ranch, Oregon 97759

The Inter-Community Simulation
Conducting Plannign Exercises
Triangle Trade

Principal Focus: Development and distribution of simulation/gaming
exercises

Principal Subject Matter: Social studies, values clarification,
professional education

Training Levels: All

140. STEM
Box 393
Provo, Utah 84601

The Clear City Water Crisis

141. Study-Craft Educational Products
RI-683 Tusson Research Center
Belle Chasse, Louisiana 70037

Transaction: The Authentic Stock Market Game

142. Teaching Concepts, Inc.
230 Park Avenue
New York, New York 10017

Circulation
Super Sandwich

143. Sivasailam Thiagarajan
Center for Innovation in Teaching the Handicapped
2853 East Tenth Street
Bloomington, Indiana 47401

GAME game II
Naked Monsters

144. 3M Company
3M Center
St. Paul, Minnesota 55101

Mr. President	Foil
Executive Action	Point of Law
Stocks and Bond	Sleuth
Facts in Five	Feudal

145. *Total Information Educational Systems
1925 West County Road, B2
Roseville, Minnesota 55113

MANAGE

146. UCCM Games
2718 University Avenue
Des Moines, Iowa 50311

Freshman Year
System

147. Union Printing Company
17 W. Washington Street
Athens, Ohio 45701
- Elements
Evolution
Lab Apparatus
148. Universal Research Systems, Inc.
363 South Taaffe Street
Suite 107
Sunnyvale, California 94086
- Drug Attack
149. University Associates
P.O. Box 315
Iowa City, Iowa 52240
- Structured Experiences for Human Relations Training
150. University Associates Publishers, Inc.
7596 Eads Avenue
La Jolla, California 92037
- Hung Jury
The Kidney Machine
151. Urban Systems, Inc.
129 Mt. Auburn Street
Cambridge, Massachusetts 02133
- Predator-Prey
Women's Lib
152. URBANDYNE
P.O. Box 134
Park Forest South, Illinois 60466
- The Youth Culture Game
Edge City College
The Church Resources Game
153. Urbex Affiliates, Inc.
P.O. Box 2198
Ann Arbor, Michigan 48106
- They Shoot Marbles Don't They?
A Gaming Exercise About Rehabilitation
Policy Negotiations
Urban Games: Four Case Studies in Urban Development

154. Actionplan
W.A.L.R.U.S. I-Water and Land Resource Utilization Simulation
Principal Focus: Design, consultation, publishing
Principal Subject Matter: Social science, urban affairs and organizational development
Training Levels: Adults
155. Warmac
P.O. Box 953
North Platte, Nebraska 69101
The Great War
156. Westinghouse Learning Corporation
619 Estes Avenue
Schaumburg, Illinois 60172
Mythia: A World Affairs Simulation
157. Westminster Press
Witherspoon Building
Philadelphia, Pennsylvania 19107
Lovable Church Game
158. WFF'N Proof
1490 South Blvd.
Ann Arbor, Michigan 48104
Equations Auto-Mate Imp Kits 1-21
Equations
The Real Numbers Game
On Sets: The Game of Set Theory
Configurations
In-Quest
Queries 'n Theories
Camericard-USA
The Propaganda Game
Principal Focus: Manufacturing and distribution of instructional games
Principal Subject Matter: Logic, mathematics, language, social studies, scientific reasoning
Training Levels: Elementary through university with chief focus now at junior high school level

159. WGBH Educational Foundation
125 Western Avenue
Boston, Massachusetts 02134

Game City
Crisis: Congo
Campus Crisis Game

160. John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Assignment Game
Bingo I and II

161. World Affairs Council of Philadelphia
Third Floor Gallery
John Wanamaker Store
13th and Market Streets
Philadelphia, Pennsylvania 19107

Simulation: The Decision-Making Game

162. Xerox Education Publications
245 Long Hill Road
Middletown, Connecticut 06457

Railroad Game

163. Zenger Publications, Inc.
Gateway Station 802
Culver City, California 90230

The Jury Game

VI. BIBLIOGRAPHY

- A. Annotated Bibliography
- B. Additional Readings
- C. Journals Carrying Articles on Games/Simulations

A. Annotated Bibliography

1. Abt, C.C. "Games Pupils Play - Why Educational Games Win Converts," Nation's Schools. October 1967, pp. 92-93.

This article describes and defines educational games and simulations. It discusses reasons for the success of games in improving learning efficiency. It discusses when and how games should be used and raises questions about evaluating their uses.

2. Abt, C.C. "Why Educational Games Win Converts," Nation's Schools. October 1967, pp. 92-93+.

Techniques are defined, examples given, and reasons are suggested to explain why simulation games improve teaching efficiency.

3. Adair, C.H. and Foster, J.T. A Guide for Simulation Design: Theoretical and Practical Procedures for the Development of Instructional Simulation. Tallahassee: Instructional Simulation Design, Inc., 1972.

This book is designed to instruct students in developing simulations with only minimal help from instructors.

4. Armstrong, R.H. R. and Taylor, J.L. (Eds.) Instructional Simulation Systems in Higher Education. Cambridge, England: Cambridge Institute of Education, 1970.

This is a group of essays describing simulation in general in certain disciplines, and the application of specific games.

5. Arthurs, B.A. "Modification of Locus of Control by a Game Approach Among Tenth-Grade Male Externals," Dissertation Abstracts International, December 1981, p. 2565-A.

Testing the use of games with tenth grade males with external loci of control, this study found that locus of control can be increased toward internality. The area of change was in intellectual achievement.

6. Avedon, E.M. and Sutton-Smith, B. The Study of Games. New York: John Wiley and Sons, 1971.

This book contains essays and bibliographies on games from several perspectives, including games in education.

7. Bandreth, G. The World's Best Indoor Games. New York: Pantheon Books, 1981.

Brief descriptions of over 250 indoor games make up this volume. Games for all ages and all occasions are explained.

8. Barton, R.F. A Primer on Simulation and Gaming. Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Barton explains the use of simulations in education, behavioral science and administration.

9. Beals, P.E. "Games and Simulations," Grade Teacher, March 1971, pp. 94+.

Beals poses questions that teachers should consider before introducing simulations and games into the classroom.

10. Beck, I.H. and Monroe, B. Some Dimensions on Simulation. Seal Beach California, 1969. (ERIC: ED 028 131).

This paper discusses the advantages and disadvantages of simulations and games. A discussion of the scope and evaluation of simulated environments is quite broad.

11. Belch, J. Contemporary Games. Detroit: Gale Research Co., 1973.

Although the copyright date makes this volume not really contemporary, just browsing through its hundreds of games provides ideas.

12. Bell, A.G. Games Playing with Computers. London: George Allen and Unwin Ltd., 1972.

This is a fascinating application of some common games like chess, poker and nim, and some not-so-common games to the computer.

13. Benson, D. Gaming: The Fine Art of Creating Simulation/Learning Games for Religious Education. Nashville: Abington Press, 1971

Religious and social educators will find this book very useful in the design of games. Eleven game explanations are given.

14. Beverina, D. and Zjawin, D. "Math Packs!" Instructor. November 1980, pp. 58-59.

This is a compilation of 41 kid-size math games.

15. Blackburn, J.E. and Powell, W.C. One at a Time, All at Once. Pacific Palisades, California: Goodyear Publishing Company, Inc., 1976.

This book is a guide to individualized instruction, particularly in the elementary classroom. It has value to early childhood and elementary education majors and teachers. A chapter is devoted to games.

16. Boocock, S. S. The Effects of Games with Simulated Environments Upon Student Learning. Unpublished doctoral dissertation, Johns Hopkins University, 1966.

Using seven different games and students attending a 4-H Convention, this experiment found statistically significant learning in four general areas.

17. Boocock, S.S. "Using Simulation Games in College Courses," Simulation and Games, March 1970, pp. 67-77.

This article discusses the merits and alternative ways in which simulation games have been used in classes on urban sociology and social psychology.

18. Carlson, E. "Games in the Classroom," Saturday Review, April 16, 1967, pp. 62-64+.

Carlson points out the strengths of simulations in the classroom while acknowledging that not all educators are sanguine about them.

19. Carlson, E. Learning Through Games. Washington, D.C.: Public Affairs Press, 1970.

This is an excellent starting place for those interested in business, social, and political simulations/games. A beautiful description of the technique is given.

20. Chen, M.S. "Health or Hazard? A Post-China Syndrome Game," Health Education, July/August 1981, pp. 30-31.

This is a description of the "Health or Hazard?" game. See game #12.

21. Cole, A., Haas, C., Heller, E. and Weinberger, B. Recipes for Fun. Northfield, Illinois: Par Project, 1970.

Basic activities for young children are described. The book is the first in a series designed for parents, teachers, and others who work with young children to help them develop learning activities using simple household materials and a little imagination.

22. Cole, A., Haas, C., and Weinberger, B. Workshop Procedures. Northfield, Illinois: Par Project, 1971.

This is a companion to Recipes for Fun, translating the ideas in Recipes into a workshop format.

23. Coleman, J.S. Academic Games and Learning. Princeton, New Jersey. (ERIC: ED 049 966).

Coleman asserts that games affect both the content and technique of teaching. They also affect the way students learn and what they learn.

24. Coleman, J.S. "Learning Through Games," NEA Journal, January 1967, pp. 69-70.

This article gives some very sound reasons why simulations are useful in the classroom.

25. Corbin, D.E. and Sleet, D.A. "Health Games, Simulations and Activities," Health Education, July/August 1980, pp. 24-26.

This article describes the "Drug Knowledge Game" and the "Grouping Game" as applied to health education. See games #2 and #3.

26. Cratty, B.J. Learning About Human Behavior Through Active Games. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Though it uses playground and movement games, this book makes an excellent effort to help the reader teach children important lessons about human behavior and himself through the constructive use of games. Activities are described which point to important principles about the ways in which people behave.

27. Criscuolo, N. "28 Games to Improve Reading Comprehension," Instructor. October 1980, pp. 88-90.

Criscuolo describes in extremely brief fashion 28 games which are designed to improve reading comprehension. The games seem to be aimed at elementary school children.

28. Cruickshank, D.R. A First Book of Games and Simulations. Belmont, California: Wadsworth Publishing Co., 1977.

This is a semi-programmed text in learning the nature of simulations and games and in designing each.

29. Cruickshank, D.R. and Telfer, R. "Classroom Games and Simulation," Theory Into Practice. Winter 1980, pp. 75-80

This article summarizes the advantages and disadvantages of games and simulations in the classroom, the research on the subject, and procedures for using games and simulations in the classroom.

30. Daniels, S. How 2 Gerbils, 20 Goldfish, 2000 Books and I Taught Them How to Read. Philadelphia: Westminster Press, 1971.

This is the story of how a junior high school teacher in an "impossible" urban setting succeeded through the use of classroom games.

31. DeKock, P. "Simulations and Changes in Racial Attitudes," Social Education. February 1969, pp. 181-3

This is a description of an informal classroom study of racial attitudes in students and the impact of a simulation game called Sunshine on Attitudes.

32. Denison, T.G. "The Effectiveness of Simulated Practice for Teaching Welding," Dissertation Abstracts International. April 1982, pp. 4424-5-A.

Comparison was made between the performance in a welding class of students for whom half of their practice time was replaced by the Blue Streak Welding Simulator and students who used the conventional arc welding practice techniques. The simulation was found to substitute for the practice.

33. Devries, D.L. and Slavin, R.E. Teams-Games-Tournaments A Final Report and the Research. Report No. 217. Baltimore 1976. (ERIC: ED 133315).

This is an analysis of the research on games in the classroom, particularly a four-year study in a classroom in which all teaching was game-based.

34. Dresher, M. Games of Strategy: Theory and Applications. Englewood Cliffs: New Jersey, 1961.

Dresher provides a theory of playing games of strategy and an extensive description of such games. This book is highly recommended for college mathematics instructors.

35. Durham, D.J. "The Use of Two Simulation Techniques with Regular Class Teachers in Educational Planning and Consultation for Learning Disabled Children," Dissertation Abstracts International. July 1981, p. 169-A.

This study compared two training simulation techniques for teaching regular class teachers consultation skills for educational planning for learning disabled children. The two techniques were live simulation training on an individual basis and viewing videotaped models in educational planning simulations. The live simulation training group demonstrated significantly more conferences with parents and resource persons. The videotaped model group demonstrated significantly more uses of consensus statements.

36. Fluck, S.A. "The Effects of Playing and Analyzing Computational Strategy Games on the Problem Solving and Computational Ability of Selected Fifth Grade Student," Dissertation Abstracts International. June 1982, p. 5020-A.

The results of this study demonstrated that fifth grade students who played computational-strategy games gained significantly in problem solving ability over a control group. There was no significant difference between the two groups concerning computation performance.

37. Friedman, A. Differential Games. New York: Wiley-Interscience, 1971.

Differential games are games in which the position of the players develops continuously in time. This book is primarily for teachers and students of course in Calculus of higher level mathematics.

38. Gardner, M. "Mathematical Games," Scientific American. October 1979, pp. 18-26.

Gardner proposes several geometric puzzles and problems that will challenge most college students.

39. Gardner, M. "Mathematical Games," Scientific American. December 1979, pp. 22-30.

Several interesting mathematical problems are presented which would challenge most students. The title is misleading, but math instructors would benefit from following this regular department.

40. Glazier, R.E. How to Design Educational Games. Cambridge, Massachusetts: Abt Associates, 1970.

This is a fine preparation of game materials and game boards for education.

41. Gonzales-Miles, M. "Effectiveness of a Cross Culture Simulation in the Development of Teacher Trainees' Worldmindedness," Dissertation Abstracts International. August 1981, p. 524-A.

Using the simulation Bafa Bafa, the study sought to determine if using the strategy would alter attitudes of worldmindedness. No significant change was found.

42. Grunfeld, F.V. (Ed.). Games of the World. New York: Holt, Rinehart and Winston, 1975.

Replete with beautiful drawings and photographs, this book discusses the history, rules and materials of games, including many educational games.

43. Gunselman, M. "And for Desert, I'll Have a Tropical Rain Forest" Instructional Innovator. November 1980, pp. 16-17.

This is a very cursory look at environmental simulation classroom such as the one at Middle Tennessee State University which can simulate arctic lands, temperate regions, humid tropics, dry lands, and black space.

44. Harbin, E.O. The Fun Encyclopedia. Nashville: Abingdon Press, 1968.

This is a seemingly endless book of leisure activities and games for all occasions. Most are for children.

45. Hisgen, J.W. "To Tell the Truth: A Classroom Gaming Procedure," Health Education. January/February 1981, pp. 32-33.

This is a description of the old TV game adapted for use in health education. See game #1.

46. Hood, S. "More Fun than a Barrel of Monkeys," Instructor. August 1980, pp. 98-107.

This is a series of brief descriptions of simple games. Most of them are suitable only for children.

47. Horn, R.E. (Ed.). The Guide to Simulations/Games for Education and Training. (4th edition). Cranford, New Jersey: Didactic Systems, Inc., 1980.

Descriptions of hundreds of games and simulations of educational value which may be purchased. If you need an idea for a game, see this volume. It is the most extensive description of games around.

48. Humphrey, J.H. and Sullivan, D.D. Teaching Slow Learners Through Active Games. Springfield, Illinois: Charles C. Thomas, Publisher, 1970.

Over two hundred games are described in detail for the development and reinforcement of reading, science, and math skills. Each game contains adaptations.

49. Hunt, M.E. "Simulated Site Visits: An Environmental Learning Strategy for Older People," Dissertation Abstracts International. March 1982, p. 3791-A.

This is a study comparing actual visits to a building with a simulation of the visits. The simulation was found to be more effective in familiarizing older persons with a building than actual site visits.

50. Hyman, R.T. Paper, Pencils, and Pennies: Games for Learning and Having Fun. Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

This is an excellent work which discusses the purposes and development of games and simulations in education. It provides a description of many games requiring few materials for players of all ages.

51. Jacobson, R.L. "Teaching with Games," The Chronicle of Higher Education. November 26, 1979, pp. 1+.

This is a news update on the state of gaming and its recognition among professionals.

52. Jacovino, J.A. "The Use of Cooperatively Structured Games as a Teaching Strategy in a Secondary School Class to Increase the Group Cooperation Behaviors of Its Students," Dissertation Abstracts International. February 1981, p. 3403-A.

A significant positive relationship was found between the use of cooperatively structured games and the development of a cooperative goal structure for the classroom versus the usage of the more traditional lessons.

53. Klein, R.D. "An Empirical Evaluation of the Effectiveness of a Simulation Game in Teaching International Business," Dissertation Abstracts International. October 1981, p. 1711-A.

This study concludes that use of business simulation sensitizes its users to critical international business issues and the technique is an effective learning tool.

54. Kohl, H.R. Math, Writing, and Games in the Open Classroom. New York: The New York Review, 1974.

Part I discusses the problem of following up a successful lesson and of children's many approaches to writing. Part II is about games, play, and learning, especially learning mathematics. Games are essential for elementary years, but can be used for adults with weaknesses in arithmetic.

55. Lentz, T.F. and Cornelius. All Together: A Manual of Cooperative Games. St. Louis: Peace Research Laboratory.

This is a manual of active and passive games designed to create cooperative attitudes in students.

56. Longley-Cook, L.H. New Math Puzzle Book. New York: Van Nostrand Reinhold Company, 1970.

This is a delightful set of 100 mathematical puzzles and solutions. The categories are number theory, finite arithmetics, general number systems, geometry, symmetry, Tessellation, perspective, topology, and probability. A creative math instructor could easily apply these puzzles to games like College Bowl.

57. Luce, R.D. and Raiffa, H. Games and Decisions: Introudction and Critical Survey. New York: John Wiley and Sons, Inc. 1957.

This book attempts to communicate the central ideas and results of game theory and related decision-making models unencumbered by their technical mathematical details.

58. Madison, J.F. "A Comparison of Attitude and Achievement of Alaska Secondary Marketing and Distributive Education Students Toward a Specific Simulation Model Versus Traditional Instruction," Dissertation Abstracts International. January 1982, p. 3127-A.

This study tested the use of a simulation and traditional methods in high school distributive education classroom. No significant differences were found between experimental and control groups in either achievement or attitude.

59. Maidment, R. and Bronstein, R.H. Simulation Games: Design and Implementation. Columbus, Ohio: Charles E. Merrill Publishing Co., 1973.

This book provides an excellent description and explanation of simulation games, their history, design, and utilization.

60. Mandell, A. and Cherry, T. " 'Germ Warfare' " The Science Teacher. September 1980, p. 37.

This is a description of a broad game for use in studying the disease process. See game #26.

61. Morris, G.S.D. How to Change the Games Children Play. Minneapolis: Burgess Publishing Co., 1976.

This book presents the thesis that the very structure of games must be analyzed in terms of the specific outcome behaviors sought. It offers a model for analysis of games and guidelines for discovering and creating new ones. Although primarily for the physical educator, the philosophy is applicable to gaming in all disciplines.

62. Mulac, M.E. Perceptual Games and Activities. New York: Harper and Row, 1977.

All the senses are utilized in these games and activities for learning math and science skills.

63. Mulac, M.E. and Holmes, M.S. The School Game Book. New York: Harper and Row, 1950.

This book presents a number of children's educational games ranging from drawing games through relays and arithmetic. Some of the arithmetics and spelling games could be utilized in the community college classroom or tutoring center.

64. Orlick, T. The Cooperative Sports and Games Book: Challenge Without Cooperation. New York: Pantheon Books, 1978.

The book delightfully examines the benefits of cooperative games and describes many games for different age groups including adults. It also includes a section on creating your own games.

65. Orlick, T. Winning Through Cooperation: Competitive, Cooperative Alternatives, Washington, D.C.: Hawkins and Associates Publishers, 1977.

This book provides a thorough look at cooperative structures, cultures, games and values, as well as means for improving the quality of our lives.

66. Orlick, T. and Botterill. Every Kid Can Win. Chicago: Nelson Hall Publishers, 1975.

For parents of children who participate in organized sports, this book points out what should be and alerts us to what often is.

67. Pauncz, E. and Elam, K. "The Dialoguing Jigsaw Game," English Language Teaching Journal, April 1981, pp. 249-252.

The article discusses the dialoguing exercise in an English class (see game #28). This appears to be a meaningful writing experience.

68. Ploeger, F.D. "The Development and Evaluation of Interactive Computer Program Simulation Designed to Teach Science Laboratory Safety to Preservice and Inservice Teachers," Dissertation Abstracts International, May 1982, p. 4782-A.

The results of this study demonstrate that a computer program simulation was effective in teaching science classroom laboratory safety to preservice teachers at a major university.

69. Protas, E.J. "A Comparison of a Model Demonstration and Role-Playing Simulation on the Transfer of Learning to a Clinical Evaluation and History in Physical Therapy Students," Dissertation Abstracts International. September 1981, pp. 113-4-A.

This study concluded that simulation can influence cognitive clinical performance but not the more overt behavioral skills in physical therapy students.

70. Richardson, G.E. and Jose, N.L. "Simulation Mind Games," Health Education. March/April 1982, pp. 45-46.

This article provides an excellent description of the simulation mind game and two examples. See simulation #10 and #11.

71. Rockwell, A. Games (and how to play them). New York: Thomas Y. Crowell Company, 1973.

An illustrated book of 43 games for children to play inside and outside. Some games are adaptable for older learners.

72. Sackson, S. The Gamut of Games. New York: Random House.

This book describes very clearly a large number of recently developed and traditional games as well as an appendix of commercially produced games.

73. Sampson, E.D. "The Development, Implementation, and Evaluation of a Computerized Laboratory Simulation Package for Introductory College Genetics," Dissertation Abstracts International. June 1982, p. 5079-A.

A computerized laboratory simulation was developed and tested to determine its effectiveness in the acquisition of skills used in genetic analysis. Simulations were as effective but not more effective than "live" laboratory experiments.

74. Shears, L.M. and Bower, E.M. (Eds.) Games in Education and Development. Springfield, Illinois: Charles C. Thomas Publisher, 1974.

This book is a collection of essays on games which has as its objective the wider use of games as teaching devices in school settings. This is a most intellectual volume.

75. Smith, P.C. "Electrifying Current Events," Teacher. October 1980, pp. 74-80.

Smith provides an enthusiastic description of a game of current events which he uses with junior high school students. See game #27.

76. Stanford, G. and Stanford B.D. Learning Discussion Skills Through Games. New York: Citation Press, 1969.

The problems of starting and maintaining discussions are addressed as well as the skills necessary to good discussion. Games problems are presented which would help develop skills and overcome problems.

77. Sullivan, D.D., Davey, B., and Dickerson, D.P. Games As Learning Tools: A Guide for Effective Use. Paoli, Pennsylvania: Instructo/McGraw-Hill, 1978.

For the teacher who is a beginner in the use of games, this is a very useful guide. It describes a rationale for using learning games, gets you started using games, presents ideas for using games diagnostically, presents guidelines for designing games and describes basic game formats.

78. Sullivan, D.D. and Humphrey, J.H. Teaching Reading Through Motor Learning. Springfield, Illinois: Charles C. Thomas, 1973.

The use of active games in reading thoroughly discussed.

79. Swaggerty, C.G. "Imaginary Vacations," Social Education. April 1981, p. 272.

This is a description of a game in which students plan their own vacations completely. The vacations are imaginary. See game #31.

80. Thomas, W.E. "The Effects of Playing the Game of Master Mind on the Cognitive Development of Concrete Operational College Students," Dissertation Abstracts International. September 1981, p. 1089-A.

Students playing Master Mind gained in cognitive development, separation and control of variables, and proportional reasoning. They also scored higher than controls on a clinical test involving several cognitive variables.

81. Troyka, L.Q. and Nudelman, J. Taking Action. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

This book contains six simulation-games for English classes to develop skills in writing, reading, speaking, and listening. The descriptions are detailed enough to allow the actual playing of the simulation. It includes work sheets.

82. Turner, T.N. "Question Games for Social Studies," Social Education. March 1981, pp. 194-196.

Turner explains the adaptation of television game shows to the social studies classroom. Such games include Jeopardy and I've Got a Secret.

83. Wentworth, D.R. and Lewis, D.R. "Reviewing the Literature: A Review of Research on Instructional Games and Simulations in Social Science and Economic Education," in Lewis, D.R. et al, Educational Games and Simulations in Economics. Joint Council on Economic Education, 1974, pp. 61-75.

This section reviews the literature and research on games and simulations in economics and social science through 1972. The research is mixed regarding the effectiveness of this medium.

84. Whipp, L.T. "Simulating World Crises," Change. May/June 1980, pp. 56-68.

A simulated terrorist attack was held at a conference on terrorism

in Lincoln, Nebraska. Hostages were taken, negotiations failed and five hostages were killed.

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English Language Teaching Journal

Instructor

Games/Simulations/Learning

Forecast for Home Economics

Theory into Practice

Teacher

Nation's Schools

The American Behavioral Scientists

Educational Technology

Social Education

Simulation and Games

Phi Delta Kappan

S³ - Simulation in the Service of Society

Behavioral Simulation Newsletter. Behavioral Simulation and Gaming Group, Political Science Department, Peoples Avenue Complex, Building D. Rensselaer Polytechnic Institute, Troy, NY 12181.

Instructional Simulation Newsletter. Simulation-Systems Program, Teaching Research Division, Oregon State System of Higher Education, Monmouth, OR 97361 (three issues annually).

ISI Learning Letter. Instructional Simulations, Inc., 2147 University Avenue, St. Paul, MI 55104 (five issues annually).

Occasional Newsletter about Uses of Simulations and Games for Education and Training. Project Simile, Western Behavioral Sciences Institute, 1150 Silverado Road, LaJolla, CA 92047 (three issues annually).

Simulation Gaming News, Box 3039, University Station, Moscow, Idaho 83843

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